KNOWLEDGE

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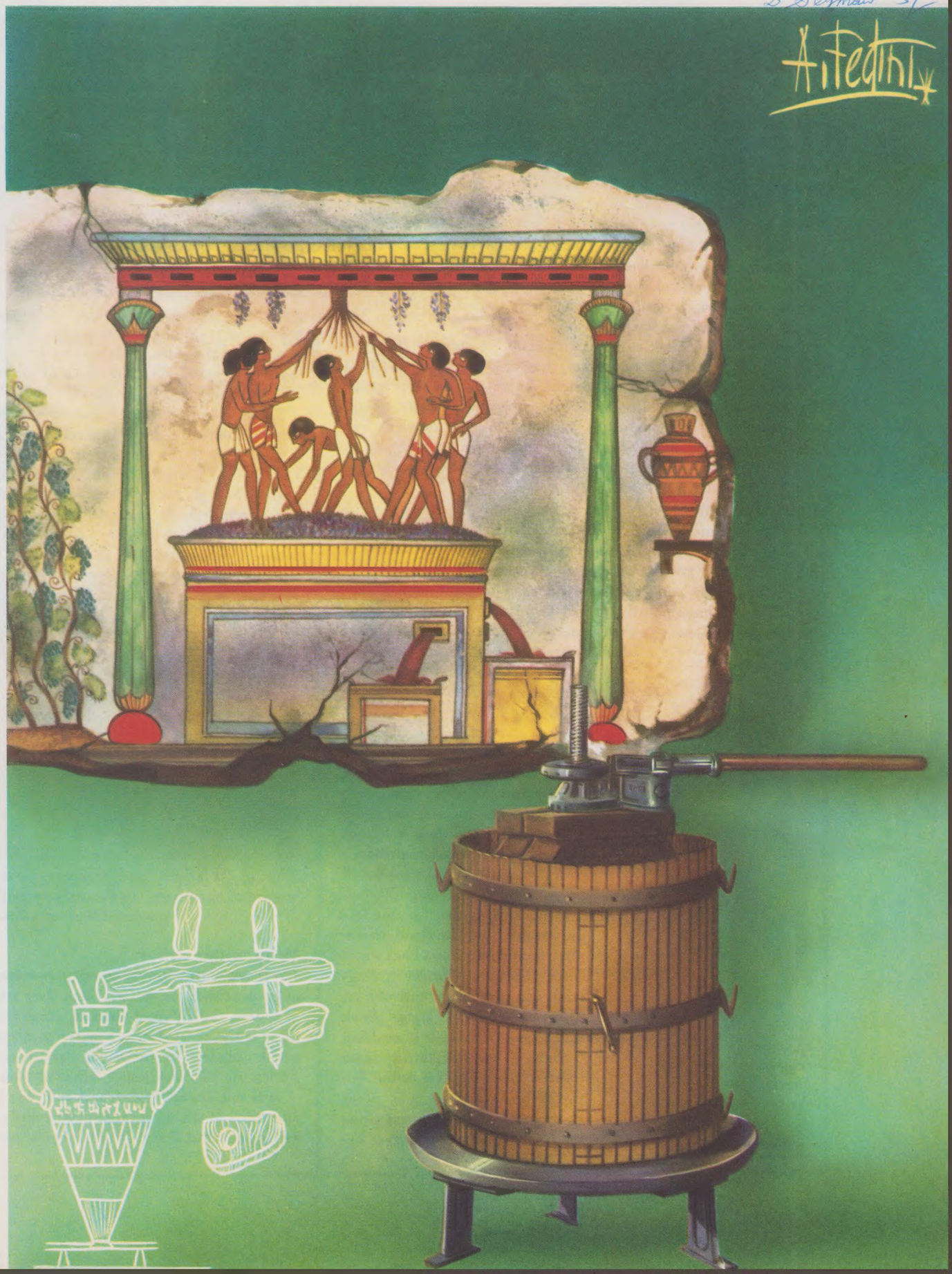

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WINE

OF all drinks wine is the most written about, sung about, talked about, and praised. Many wines have almost a personality of their own, and the words used to describe wine could equally be applied to humans: 'mature', 'delicate', 'subtle', 'full-bodied', 'shy', 'noble', and so on. To some people a bottle of fine wine is what a great painting is to an art connoisseur or a great symphony is to a music lover. The knowledge that some people have of wine is so specialised that a connoisseur can often tell at first tasting not only what part of the world the wine comes from but the very year in which its grapes were gathered (its *vintage*) and the vineyard from which it came.

Wine, like all alcohol, can make a person's behaviour different from normal. It has been said that a man is really his natural self under the influence of wine, and there is a saying, *In vino veritas* (In wine there is truth). But wine, like any other alcoholic drink, should be drunk in moderation. If you drink too much it will make you drunk, and the effects of too much wine can be just as nasty as those of any other alcoholic drink.

History of wine

In France and most south European countries wine is as cheap and plentiful as it was in the ancient world. Indeed the history of wine is almost as ancient as that of man himself. Just as today we have our cheap and expensive wines, so did people in ancient times. The Romans greatly prized the Italian Falernian wine, which the poet Horace praised so much – 42 B C was a really good vintage year for this wine. The barbarians who invaded Europe were not really interested in the subtleties of wine; they drank it as beer is drunk today.

Bacchus, the Roman god of wine (from a marble sculpture by Michelangelo, now in the National Museum, Florence)

Up to the reign of Henry III there were numerous vineyards in England. Many of these were owned by the monasteries, who needed wine for their religious services. But when the province of Aquitaine became established as an English possession, wine-growing in England became less important, and England thereafter imported many of her wines from Aquitaine. However, England did not rely entirely on Aquitaine wines. Later Sack from Spain, Rhenish wine from Germany, and Malmsey from Cyprus were also imported. In the 18th century the rich, sweet Portuguese wine produced along the banks of the Douro river became very popular. This was shipped through the town of Oporto and was known as port. Britons are still the greatest port drinkers in the world.

Until quite recently in Britain wine was considered a rich man's drink. Now this is changing, as cheap wines are being imported into this country. Today quite a good bottle of wine can be had for as little as 10*s*.

How wines are produced

Wine is the fermented juice of grapes, although the description wine is occasionally applied to the fermented juice of other fruits, flowers, and vegetables. The techniques of fermenting grape juice vary enormously and some are extremely complicated. There are, however, three basic stages in making wine. First, the grapes are gathered and pressed. In parts of Europe people still use the old method of stamping on the grapes, but wine presses are generally used. Next the juice, obtained by pressing, is put into a fermenting vat together with the mush of grape-skins, stalks, and pips. Here fermentation takes place.

When the fermentation has raised the alcoholic content of the wine to the required level (usually from 7 to 12 per cent) the wine is drained from the fermenting vat into casks which are stored in a cool cellar for some months. After eight or nine months it is passed through a filter which removes all but the smallest impurities. It is now ready to drink. It may be bottled at this stage, or, if it is of high quality, it may be left to mature for a period varying between six months and 12 years.

Picking the grapes and preparing a wine press (taken from a mediaeval painting) – in the early part of the Middle Ages England produced most of her own wine

Why wines differ

There are many factors which give wines their qualities: the kind of grapes used, the soil in which they are grown, the climate, and, of course, the different ways in which they are fermented. The climate is the most decisive factor in deciding whether or not wine can be made. For instance, Britain is too cold and equatorial Africa too hot to produce wines to please present-day palates.

It is not always the richest soil that produces the best grapes, and some of the most famous vineyards are on hillsides where the soil is poor; but drainage of the soil is very important. The flavour

Previous page: Wine producing through the ages:
(*Above*) Ancient Egyptians stamping on grapes
(*Bottom left*) An Ancient Egyptian amphora for storing wine, and the parts of a primitive wine press
(*Bottom right*) A modern mechanical press.

KNOWLEDGE NEWS

Week beginning 8th September 1963

Mao Tse-tung of China

THE GREAT COMMUNIST SPLIT

Krushchev of the Soviet Union

OVER 1,000,000,000 of the world's population are under the rule of a Communist government. Until quite recently the governments of Communist countries preserved a united front to the world; but for some time there had been hints of disagreements. Now these disagreements have come out into the open, and a bitter quarrel has been revealed between the two greatest Communist powers – the Soviet Union and China. To give you an idea of what this quarrel is about let us imagine that a Russian and a Chinaman are discussing their differences.

THE CHINAMAN MIGHT SAY:	THE RUSSIAN MIGHT REPLY:
According to the teaching of Marx and Lenin armed conflict between Communism and Capitalism* cannot be avoided. Lenin wrote: 'As long as Capitalism and Socialism remain we cannot live in peace.' You are going back on the teaching of the founders of Communism in your softer policy towards the Capitalists. You have been weak; the great Communist ideal is fading. You are exaggerating in your talk about the destruction which nuclear weapons could do if there were another war. **Capitalist countries are those in which large-scale capital enterprises (big businesses) are in individual hands – e.g. United States and Great Britain.*	When Marx wrote he had no idea of what conditions would be like today. He thought that the clash between Communism and Capitalism would come inside the state: that the workers would rise up against the Capitalists. He never thought of Communist countries coming into conflict with Capitalist countries. Lenin, when he wrote, did not realise that there could be weapons as destructive as nuclear weapons. You say we are exaggerating the effects of a nuclear war. It might not worry you to lose 200 million people, but, if we did, there would virtually be no Russians left.
Marx and Lenin said that revolutions, overthrowing Capitalist regimes, must be violent. Your revolution was violent and so was ours. Now you are relying more on constitutional means in the struggle to bring about new Communist states.	All Communist revolutions are inevitable and they occur when the time is ripe. You are endangering the peace of the world by trying to stir up revolutions. Moreover, you seem to be advocating an anti-white policy in the countries in which you are stirring up trouble. Marx and Lenin would not have agreed with this.
You have reviled your great leader Stalin. You have removed his body from the mausoleum where he lay with Lenin, and his name from your streets and towns. He was the man who made your state great. He did not depart from the teachings of Marx and Lenin.	Under Stalin, the Soviet Union was a Stalinist not a Communist country. Stalin spent vast sums of money enlarging his own authority and arming the nation to the teeth. He was also one of the most oppressive rulers in the world's history. Stalin's police chief, Beria, used methods we never want to see repeated in a civilised country. Instead of making the Russian people happy Stalin made sure that the Russian state was strong. [*continued on page 2*

continued from page 1

You abandoned the Cubans. You withdrew your rocket bases when the Americans threatened to use force.

Our rockets were withdrawn purely to prevent a nuclear war, and were only withdrawn when the Americans guaranteed not to invade Cuba. If we had stayed put in Cuba there probably wouldn't be any Cuba left. It was a victory for no one, but a triumph for humanity.

China is poor. The Soviet Union is rich, but the Russians are not helping the Chinese in their struggle to reach a higher standard of living. They have refused trade and aid.

China has received a considerable amount of Soviet aid but can she really expect the Soviet Union wholeheartedly to support a state whose leaders every day revile her and try to degrade her in the eyes of the other Communist parties? You should concentrate on raising your standard of living rather than on warlike preparations.

THE TWO SIDES

Chou En-lai of China

On the right is how the Communist states are divided in their allegiance: first are the supporters of China and then those of the Soviet Union. The names of the leaders or heads of state are given, together with approximate population figures. As you will see, many of the leaders owe their positions to their offices in the Communist Parties.

Ho chi Minh of North Vietnam

Tito of Yugoslavia

Kadar of Hungary

Novotny of Czechoslovakia

CHINA

Population nearly 800,000,000*; Chairman of the Chinese Communist Party: Mao Tse-tung; Prime Minister: Chou En-lai.*

Albania. *Population:* 1,700,000*; First Secretary of the Albanian Communist Party: Enver Hoxha.*

North Korea. *Population:* 8,000,000*; President: Yong Kun Choi.*

North Vietnam. *Population:* 16,000,000*; President and President of the Vietnamese Communist Party's Central Committee: Ho chi Minh.*

THE SOVIET UNION

Population: 220,000,000*; Chairman of the Council of Ministers, First Secretary of the Soviet Communist Party: Nikita Krushchev.*

Bulgaria. *Population:* 7,900,000*; First Secretary of the Central Committee of the Bulgarian Communist Party: Todor Zhivkov.*

Cuba. *Population:* 6,500,000*; 'Revolutionary Leader' and Prime Minister: Dr Fidel Castro Ruz.*

Czechoslovakia. *Population:* 13,700,000*; President, and First Secretary of the Central Committee of the Czechoslovakian Communist Party: Antonin Novotny.*

East Germany. *Population:* 17,000,000*; First Secretary of the Socialist Unity Party: Walter Ulbricht.*

Hungary. *Population:* 10,000,000*; Prime Minister: Janos Kadar.*

Poland. *Population:* 30,000,000*; First Secretary of the Central Committee of the Polish Communist Party: Wladyslaw Gomulka.*

Romania. *Population:* 18,400,000*; Chairman of the State Council, Head of the Politburo, and First Secretary of the Romanian Workers' Party: Gheorghe Gheorghiu-Dej.*

Yugoslavia. *Population:* 18,500,000*; President of the Federal People's Republic of Yugoslavia, Chairman of the Federal Executive Council, and Marshal of Yugoslavia: Josip Broz-Tito.*

Letter from the Editor-in-Chief

37 HERTFORD STREET, LONDON, W.1.

MOST of *Knowledge News* this week is about a quarrel – between the Soviet Union and China. Quarrels between nations are nothing new either in the last 30 years or in the last 3,000. They have often been the result of wars in which thousands, sometimes millions, of lives have been lost.

But supposing you had to fight in a war and you were put in the position of having to shoot someone on the opposing side – what quarrel would *you* have with him? You would probably realise that he was a perfectly pleasant person whom you might even like for a friend. In fact it would not have been you who had started the quarrel at all, but your government and the government of the opposite side. It seems such a pity that because of the warlike attitudes of governments, the people of their countries should be dragged into their quarrel – a quarrel which they may not fully understand, anyway. But history is made up of quarrels – Catholics and Protestants, royalists against republicans, and so on and so on. To us today most of them seem pointless. Perhaps looking back on the things we quarrel about today they will seem pointless too. In perspective the squabbles between the United States and the Soviet Union, and the Soviet Union and China, may seem much less important than they are at present thought to be.

After all, the American government has much more in common with the Russian than it has differences. What is lacking is not a common interest – but the will or ability to recognise it.

John Chancellor

The differences of their leaders do not seem to worry these young Chinese (left) and Russians (right)

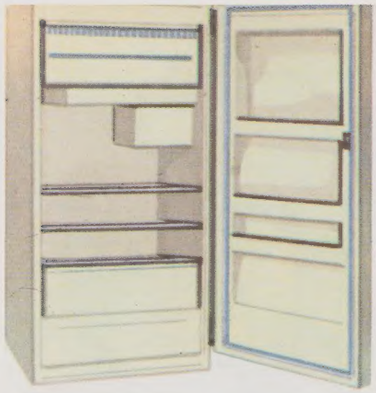
THE BACKGROUND TO THE QUARREL

THE quarrel between China and the Soviet Union is both ideological and political. It is *ideological* because it is about the ideas which should govern the actions of Communist countries. It is *political* because it concerns the leadership of the whole international Communist movement.

Now perhaps you think that these squabbles over the ideologies of Marx and Lenin are pointless. What should it matter to a Communist today what ideas these men had? It means very much to them because a Communist state is an attempt to put the ideas of Marx and Lenin into practice. In the Soviet Union in 1917, and in Communist China in 1949, there were revolutions which resulted in a government completely changing the nature of the state, saying that henceforth it would be governed by certain ideas: that all men would be equal; that the state would own and control everything, but the people would own the state. It is because ideas have played this vital role in the formation of Communist states that the argument between the Soviet Union and China has been so bitter.

But material differences between the two countries have also helped to widen the rift. Much of China today is in a similarly backward economic condition to that of the Soviet Union forty years ago. Karl Marx wrote: 'Workers of the world unite, you have nothing to lose but your chains; you have a world to win.' The Russians have won their world and have a lot to lose by going to war or by encouraging pointless revolutions. The Chinese, with very little to lose, are much more inclined to take the doctrines of Marx and Lenin literally.

The clash between the two giants is also a political one. The interests of the Soviet Union and China are clashing on a worldwide scale, just as 50 years ago did those of Britain and Germany. China and the Soviet Union are striving for control of the Communist parties not only in Communist countries, but also in those where there is no Communist government.



Inside a domestic refrigerator

THE REFRIGERATOR

WHEN you switch on your electric fire it quickly becomes red hot. But when you switch on your electric refrigerator you get exactly the opposite result – its temperature drops to below freezing point.

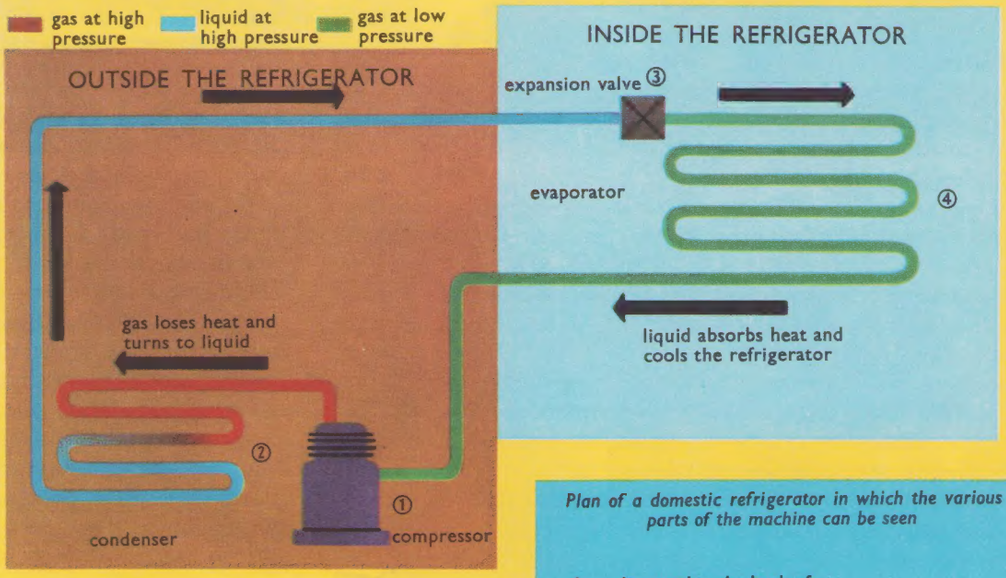
How can an electric current produce both heat and cold? The answer is that it does not. An electric current used directly only produces heat; in a refrigerator it serves only to drive the compressor, and we will explain what a compressor is later.

So why, then, is the inside of a refrigerator colder than the outside? To understand it, we must remember three important rules of physics: (1) That when a liquid turns into a gas it must absorb heat. This law explains why when perspiration dries, one feels colder; the perspiration, a liquid, evaporates into a gas and absorbs heat from the skin, so cooling it. (2) That, in the opposite way, when a gas condenses into a liquid it must give out heat. (3) That when a gas is compressed its temperature rises. This is why a bicycle pump gets warm.

In a refrigerator we use certain chemical substances which are gases at normal pressures and at room temperature. But they can be easily compressed, then cooled to turn them into liquids. Some examples are Freon (dichlorodifluoromethane), CCl_2F_2; sulphur dioxide, SO_2; ammonia gas, NH_3; and methyl chloride, CH_3Cl. These substances are called *refrigerants*. They are circulated in pipes where they change from a liquid to a gas; in the change they extract heat from the inside of the refrigerator, and so cool it.

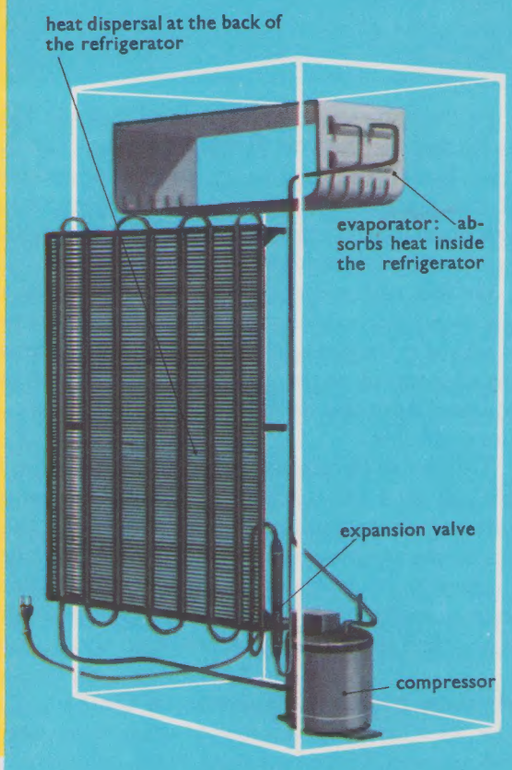
HOW IT WORKS

Since it would be very expensive to let the gas escape from the refrigerator and to keep supplying new refrigerant liquid, a way must be found to use the refrigerant over and over again. In the diagram shown below, the refrigerant flows in a closed circuit; that is, it circulates continuously along the same path. Since we are turning the liquid into a gas to cool the inside of the refrigerator, then somewhere else in the circuit we must turn the gas back into a liquid. Now let us see how this is done.



An electric motor drives a *compressor* (1) which compresses the gas and pushes it towards the condenser. As the pressure of the gas increases it gets warmer. When the gas reaches the *condenser* (2) it loses heat because the air surrounding the condenser (outside the refrigerator) is cooler than the gas. As the compressed gas becomes cooler it condenses into a liquid, which is still at a high pressure. This prevents it from changing back into a gas. When it reaches the *expansion valve* (3) the liquid has to pass through a small hole, so it becomes sprayed into the *evaporator* (4) in the form of a mist of tiny drops. In the evaporator the refrigerant is no longer under pressure, so it can now change from a liquid to a gas. Rule 1, explained above, is now seen in action. In order to change into a gas, the liquid must absorb heat; this heat is taken from the air surrounding the evaporator. Because the evaporator is placed inside the refrigerator this becomes colder. To complete the circuit, the gas returns to the compressor to start its journey round again.

Plan of a domestic refrigerator in which the various parts of the machine can be seen


heat dispersal at the back of the refrigerator
evaporator: absorbs heat inside the refrigerator
expansion valve
compressor

INDIA : history

WHEN we talk about India as it was thousands of years ago, we must forget India as it is today. India did not become anything like a united country until the 19th century – before then it was a succession of different empires and civilisations. The greatest of these were centred in the north and seldom included tribes of the south, and it was in fact the British who for the first time brought most of India under one rule.

Though the country was disunited, many of the northern civilisations were extremely advanced – in fact, 5,000 years ago India was in parts much more advanced than it is today. Humane laws, skilled artists, efficient administration, universities, free medical treatment: India had all these when Europe was still populated only by barbaric tribes. Yet this early start was a prelude to years of foreign oppression.

Buddhist and Hindu: a golden age

In 516 B C Darius conquered the northern Punjab, which thus became part of the Persian empire; and as such Alexander the Great invaded it in 326 B C. He marched down the Indus and established a strong naval base at Patala near its mouth. But in 323 B C Alexander died and the Greeks were expelled from the Punjab by one of the first great Indian leaders – Chandragupta Maurya.

Chandragupta's empire covered almost all northern India; he had a very efficient government and elaborate administration which even included registration of the births and deaths of his subjects. His grandson Asoka was the greatest ruler of this early period. Soon after his succession Asoka fought a terrible battle in which 100,000 were slain; he was so upset that he decided to renounce war and devote himself to religion. He became converted from Hinduism to Buddhism, which was thus raised from being a minor sect to being the religion of a great empire (see page 2182). Asoka was an energetic missionary; he sent envoys all over India, to Egypt, Syria, and above all to Ceylon, where Buddhism, long since dead in India, still lives on today.

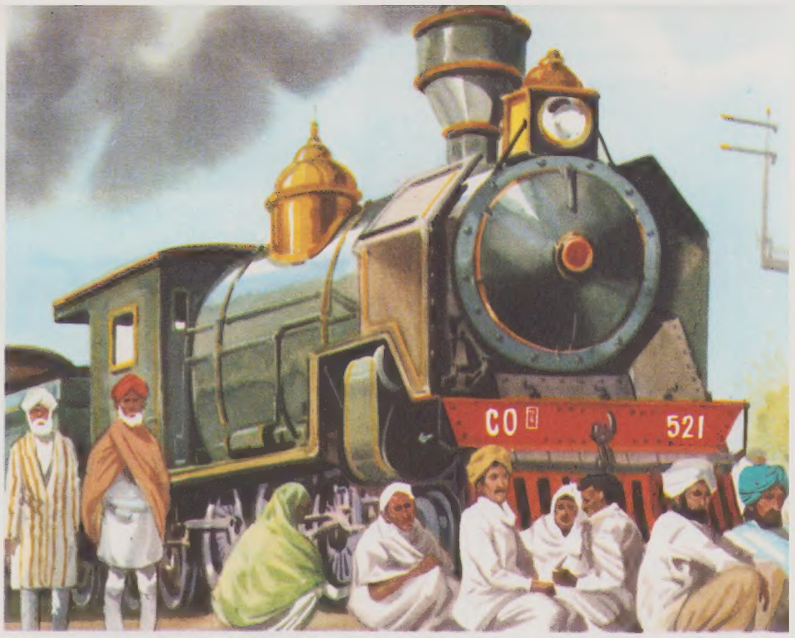
By the 2nd century A D the empire of the Mauryans had been succeeded by the new Kushan empire. The Kushans were devout Buddhists and under them the religion was taken to China. There was wide trade and commerce in this period, and influence from Persia, Greece, Rome, and China had a profound effect on Indian culture.

By the 5th century Buddhism was dying out in India; the Gupta empire, which was the greatest of this period, and indeed of all early Indian history, was Hindu. A Chinese described it in glowing terms; taxes, we hear, were light; there was no death penalty, and the capital was, in his words, 'the work of no mortal hands'.

This great Hindu age was cut short by the Hun invasions of the 5th and 6th centuries. The great empires disintegrated into fragmentary states; many of them, on the eve of the Muslim invasion, were ruled by an aristocracy called Rajputs which claimed to be descendants of the ancient Hindu warrior caste. India now had nearly 1,000 years of foreign domination ahead of her; first under the Muslims, then the British.

Muslim masters: Sultans of Delhi

The next invaders of India were to be the Muslim Arabs: Indians and Arabs had been trade rivals from the 8th century onwards, and by the 11th century successive invasions had made these Muslims masters of India. The Arab conquest had been



Gandhi denounces the rule of the British in India – it was his devotion

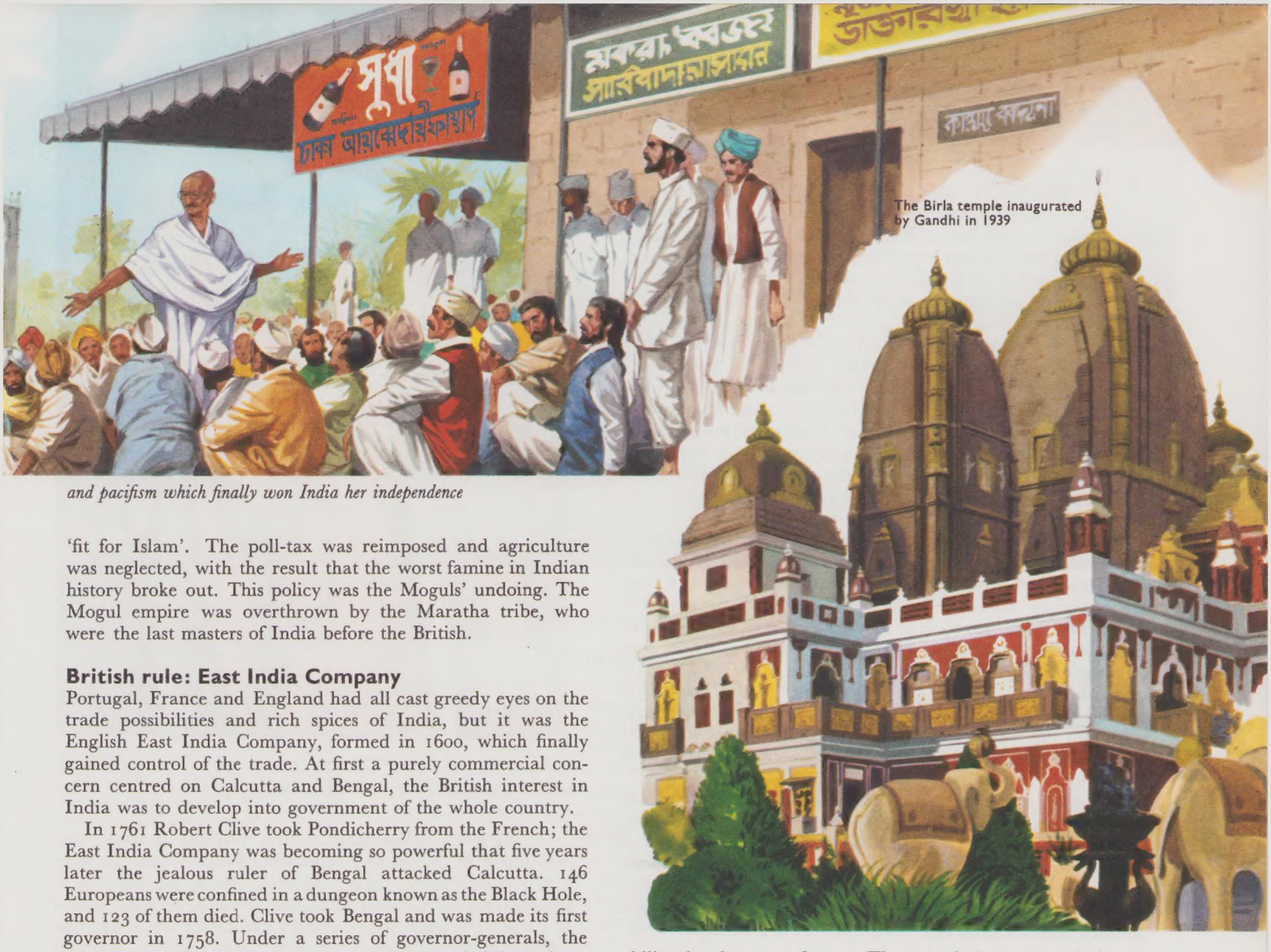
easy. The Muslims were fanatically religious and thought it was their mission to stamp out Hinduism. The Hindus, on the other hand, were divided into innumerable castes and the country could offer no resistance as a whole. The pacifist ideas of Buddhism had made the Indians less war-like. The Arabs had the best horses in the world but the Indians relied on elephants. Their defeat was to be a disaster for India.

In 1226 a certain Altamsh was recognised as Sultan of India; he was the first of 26 Muslim rulers to occupy the throne of Delhi. Ferocious persecution, bloodshed, and cruel oppression characterised their rule – with one exception. Firoz Shah (1351–1388) made a real effort to repair the damage. He introduced reforms way ahead of his age; extensive irrigation plans, care of the poor, employment bureaus, and dowries for the orphaned daughters of soldiers were among his schemes. But his successors were less enlightened and began a vigorous persecution of Hinduism. Hindu temples and Sanskrit literature declined, and the Indian spirit was almost broken. However, of necessity, once the first fierce tide of conquest had ebbed, there was some mixing of the two cultures, the most fruitful result of which was the emergence of a common language known as *Urdu*. For all their barbarity the Delhi Sultans were not illiterate, and as time went on their courts became centres of learning, and, very important, Indian history began to be written for the first time.

The mighty Mogul empire

Babur (the lion), a descendant of Timur the Lame and Genghis Khan, invaded India and took Delhi in 1525. During the next 200 years this powerful Mogul dynasty conquered most of India. The Mogul empire reached its height under Akbar (1560–1605), one of the most impressive figures of Indian history. Himself illiterate, he was a great patron of music, painting and poetry. He abolished the poll-tax which had been humiliating Hindus for so long and made a valiant attempt to introduce religious toleration. He even invited three Jesuit priests from Goa to attend his 'parliament of religions'. Sadly, his death was followed by renewed persecution of the Hindus. The peacock throne at Delhi, worth £1,000,000, and the fabulous Taj Mahal were symbols of the Mogul age, but they belied the miserable condition of the country as a whole.

Akbar had established peace by making the Rajputs, who were still the Hindu leaders, his allies. His successors were determined, in the words of one of them, to make India a land



and pacifism which finally won India her independence

The Birla temple inaugurated by Gandhi in 1939

'fit for Islam'. The poll-tax was reimposed and agriculture was neglected, with the result that the worst famine in Indian history broke out. This policy was the Moguls' undoing. The Mogul empire was overthrown by the Maratha tribe, who were the last masters of India before the British.

British rule: East India Company

Portugal, France and England had all cast greedy eyes on the trade possibilities and rich spices of India, but it was the English East India Company, formed in 1600, which finally gained control of the trade. At first a purely commercial concern centred on Calcutta and Bengal, the British interest in India was to develop into government of the whole country.

In 1761 Robert Clive took Pondicherry from the French; the East India Company was becoming so powerful that five years later the jealous ruler of Bengal attacked Calcutta. 146 Europeans were confined in a dungeon known as the Black Hole, and 123 of them died. Clive took Bengal and was made its first governor in 1758. Under a series of governor-generals, the rule of the East India Company gradually extended throughout the country. Kingdoms were absorbed first by alliance and then by the 'doctrine of lapse' whereby princes without heirs were forbidden to adopt successors, their states thus passing under British influence. At first refraining, both from lack of interest and on principle, from any interference in the Indian way of life, the company gradually began to reform and modernise the country; for instance the English language was introduced for higher education, and *suttee* (widow burning) was abolished. In 1833 the company's monopoly was abolished and any Englishman was given the right to trade in India. The company was incapable of administering the whole country; sooner or later the British government would have had to take over; the revolt of company troops in the Indian Mutiny of 1857 made this an immediate necessity. In 1858 an Act of Parliament was passed saying that India was to be governed directly in the name of the Crown.

Crown rule and independence

The rule of the great Victorian viceroys prepared India for self-government. The three Indian Councils Acts of 1861, 1892, and 1909, giving the Indians an increasing hand in the administration of their country, were all important steps towards independence. But right up to the oubreak of the First World War Britain did not envisage this as a practicable possibility in the near future. The population was still largely illiterate, and split by creed and caste into innumerable small groups. The First World War changed all this; over 500,000 Indians served and sustained 96,000 casualties. In the 1920's nationalist agitation, led by Gandhi's Indian National Congress, became increasingly insistent in its demands; and in 1929 the Congress finally defined its aims as complete independence. Between the wars the British government tried hard but unsuccessfully to reach a compromise. The Indians' contribution to the Second World War – during which they suffered nearly 180,000 casualties, over 24,000 fatal – meant that independence could not be withheld much longer.

A serious difficulty arose, however, over the fact that although India was predominantly Hindu there were powerful Muslim settlements in the north. The only solution was for these settlements to form an independent state of their own – Pakistan. Yet many Indians resented Pakistan's exclusion from India, and one patriotic fanatic assassinated Gandhi shortly after Indian independence was declared in 1947. One of India's most serious problems today is her border dispute with China. The Sino-Indian border has never been mutually agreed and the Chinese are claiming many thousands of square miles of north-east India. The quarrel reached a climax in 1962 when the Chinese launched a massive invasion into Indian territory, although later they withdrew.

PITT THE ELDER

IN the black year of 1756 the guns of war echoed over Europe. Facing Great Britain was a seemingly invincible coalition of France, Russia, Austria, Sweden, and Saxony. Yet as the nation tottered in panic and despair, a voice rang out which was to rally her to victory. 'I know that I can save this country and that no one else can.' The voice belonged to William Pitt.

In some ways William Pitt, Earl of Chatham, represented all that was bad in British 18th-century politics. He got his first job – that of a cornet in the king's regiment of horse – through the influence of his friend Viscount Cobham; and when he was only 27 he entered Parliament as a member for a ruined mound called Old Sarum – the most notorious of all the pocket boroughs. And once in Parliament he did as he was told. As Lord Cobham wanted, he vigorously opposed the government. He became one of 'Cobham's cubs'.

Politics in the 18th century were sordid and corrupt. In theory there were two parties: the Whigs and the Tories. But the Tories had been virtually eliminated on account of their opposition to the accession of the Hanoverian dynasty. The Whigs and the Hanoverian kings supported each other, and the kings chose their ministers from among the Whigs. Since most of the constituencies were controlled by the great Whig families this meant that not only the king's ministers but also nearly all the MPs were Whigs. The opposition came, oddly enough, not from the feeble Tories but from those Whigs who were jealous of members of their own party who were in high positions and enjoyed large salaries.

Pitt did not take long to make his mark. He rapidly gained a reputation for championing the cause of British overseas expansion and commercial interests. His democratic appeals to the 'voice of England' gained him support from outside Parliament, and he soon became the leader of the so-called 'patriots'. He criticised Walpole and his successor Carteret for their mishandling of the Austrian War of Succession (1741–1748); his plan was to attack France not in Europe but in her colonies—especially in America. For here a victory over France could result in great gains for the British Empire.

Carteret resigned in 1744 and an old colleague of Walpole's, the Duke of Newcastle, took over. It was becoming increasingly obvious that Pitt could not be kept out of the government, and in 1746 he was made Vice-Treasurer of Ireland and Paymaster-General of the Forces.

Yet Pitt's progress was slow and his frustration at being excluded from the highest offices increased. His two greatest consolations came from his private not his public life. He received a legacy of £10,000 from the Duchess of Marlborough, and in 1754 he married Hester Grenville, who became a source of comfort and inspiration to him. Among their children was William, who was to follow his father's footsteps not only as Prime Minister but also, in the Napoleonic Wars, as a war leader.

Pitt takes charge

Pitt's chance came in 1756 when the Seven Years War broke out and Britain found herself on the verge of collapse against a formidable coalition including Russia, Austria, and her great enemy France. A series of disasters alarmed the public, who clamoured for Pitt. In November 1756 he joined the government as Secretary of State to take charge of the war.

William Pitt, 1st Earl of Chatham (1708–1778). *Though afflicted by periods of insanity, his personality inspired his country to a great victory*

It was Pitt's astonishing energy, brilliant strategy, and wise choice of commanders, including James Wolfe (see page 1041), which made victory possible. Above all, his superb oratory inflamed national pride, and it was largely due to him that when the peace treaty of 1763 was signed the British had virtually destroyed French power in North America, captured Minorca, and gained several possessions in the West Indies.

But before the end of the war, in October 1761, Pitt resigned. A new king had come to the throne – George III had succeeded George II in October 1760, and both he and his favourite minister, Lord Bute, disliked Pitt. Yet Pitt remained the greatest man in the government. He had now become independent of the various political groups and used his influence on matters of principle. He supported Parliamentary privileges and opposed the high-handed rule of the British in America. It was largely due to him that the hated Stamp Act was done away with; and in 1766, following a constitutional crisis, he formed his own ministry and entered the House of Lords as the Earl of Chatham.

But his health was giving out and he suffered from severe gout, and particularly from a form of insanity which afflicted many members of his branch of the family. He resigned office in 1768 after two years of almost complete seclusion, and the rest of his political life was a story of deepening tragedy. It alternated between brilliant and impassioned appeals for liberal government in America and fits of worsening insanity. He was saved from bankruptcy only by the astuteness of his wife's management, and he collapsed on 17th April 1778 after a great speech demanding immediate conciliation with the rebellious Americans. He died a few weeks later on 11th May.

GLACIERS

TODAY permanent ice covers about 3 per cent of the total area of the earth, or roughly 10 per cent of its land area. These ice-covered areas vary considerably in character. Some are comparatively small, narrow, steeply-sloping *valley glaciers*, which occur in all the mountain ranges high enough to carry snow throughout the year. At the other extreme are the vast *continental ice sheets* which cover five-sixths of Greenland (see page 988) and almost all Antarctica (see page 1144).

At certain times during the last million years glaciers and ice sheets were much more extensive than they are now. During the period of the Ice Ages, known to geologists as the Pleistocene Epoch, great continental ice sheets covered most of northern Europe and North America. At the time of their maximum spread, an ice sheet centred over Scandinavia stretched right across the North Sea and covered Britain almost completely, extending as far south as the Bristol Channel.

Such vast expanses of ice are now limited to polar regions, but many valley glaciers exist in mountainous regions like central Norway, the European Alps, and New Zealand.

THE SNOW LINE

We have already described (see page 1468) how the temperature of the air drops with increasing height above sea-level, so that condensation occurs and clouds form. If the upper slopes of a mountain lie above the freezing level, snow will fall and the clouds will deposit freezing fog or *rime*. If the mountain is so high that the temperature seldom or never rises above freezing point, the snow will continue to accumulate. The level where the snow begins is called the *snow line* (see page 554) and its height will vary with the situation and climate of the range.

This valley glacier is one of many in the Southern Alps of New Zealand. The points marked A to G across the glacier show how the ice moves forward, more quickly in the middle than at the sides

The accumulation of snow

Newly fallen snow does not often remain for long on very steep slopes. It is either blown away by the wind as soon as it settles, or it lodges for a few days on narrow ledges until it falls in avalanches to the gentler slopes and valleys below. Most of the windblown snow collects here, too, so that the area immediately beneath the steepest slopes generally has the greatest accumulation of snow. Occasionally, as on Mont Blanc and some Norwegian mountains, the summit slopes are gentle enough for the snow to collect there until, through the centuries, it forms a *glacier cap* at the top of the peak.

After it has fallen, snow undergoes a series of changes. A snowflake is usually made of a collection of delicate hexagonal ice crystals, which often reach the ground without breaking. Air is trapped between the branching arms of the crystals. The first change that takes place is the gradual breakdown of the snow crystals so that the air escapes. This means that *settled snow* is more compact than freshly fallen snow. Gradually a coarser, more granular snow is formed, which has much larger crystals resulting from the combination of many separate snow particles. This sort of snow is known by its German name, *firn*. If you dig a hole in the firn, you can see that it is in layers, each layer representing one year's accumulation of snow. Several feet down, however, the firn becomes less granular. Further changes in its structure take place, so that it now forms true glacier ice.

Glacier flow

Glacier ice is solid, but the pull of gravity causes it to move, so that a glacier flows downhill. It is not yet fully understood how a glacier moves, but several factors are believed to affect this movement. First, the ice deep within the glacier is greatly compressed by the weight of ice and firn above it; under pressure ice behaves like a liquid without actually melting and will move. Secondly, layers of ice slide over others. This movement, called *shearing*, is known to take place in small, thin glaciers. It is probable that both these types of movement occur in larger, thicker glaciers.

However, two certain things are known about the movement of glaciers. The middle part of a glacier flows more quickly than its sides, and the ice at the bottom (or *sole*) of the glacier flows more slowly than the ice above it. Both these things are caused by the friction of the sides and floor of the valley in which the glacier lies.

This is shown in the picture above. If a row of stakes were driven into a glacier at the points marked A, B, C, D, E, F, and G, they would in time progress to the points B′, C′, D′, E′, F′, and then to B″, C″, D″, E″, F″. The stakes at the sides, A and G, would hardly advance at all.

The speed of a glacier varies with the climate and time of year, amount of accumulation, and the steepness of its bed. A glacier generally moves only a few feet each year.

Ablation

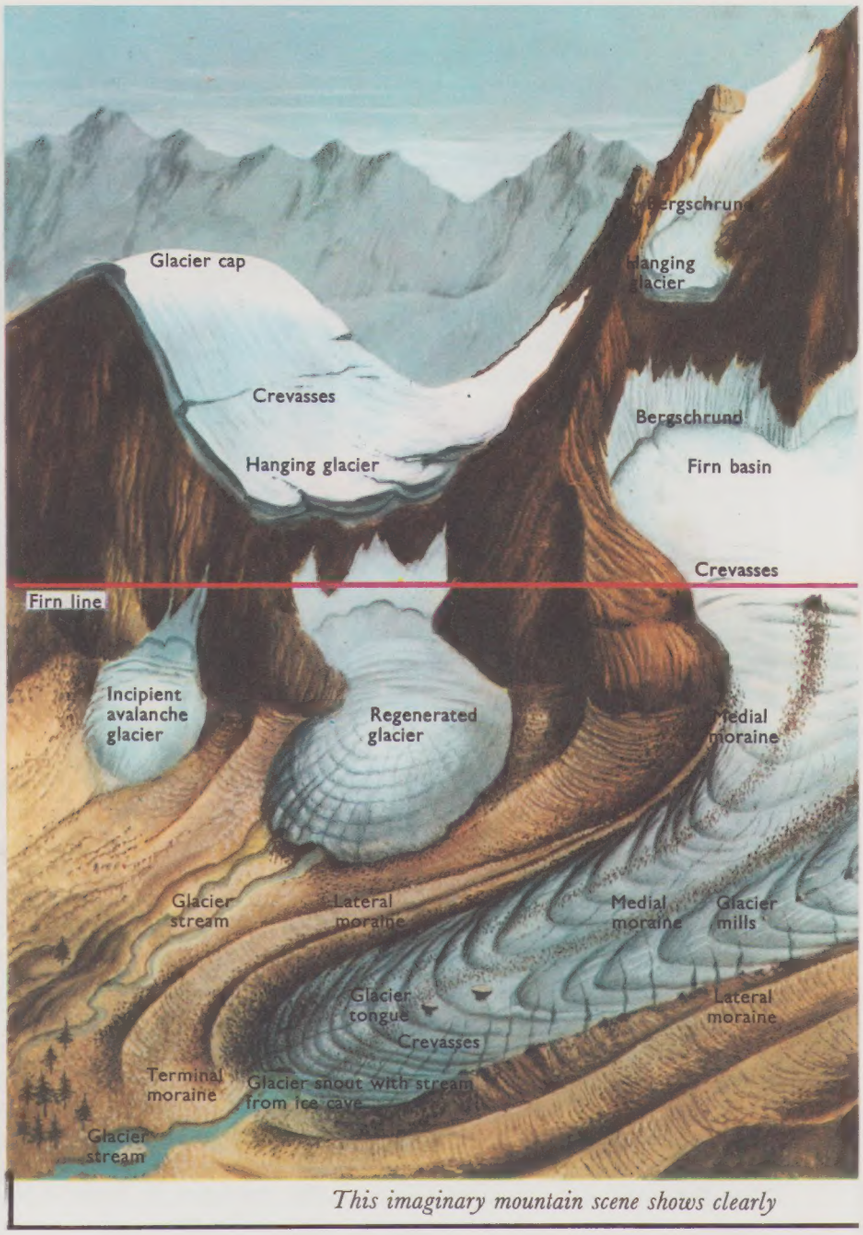
Below the snow line ice begins to melt. Even at temperatures below freezing, snow and ice gradually evaporate. Where actual melting occurs, the water gathers into small streams which, in turn, help to melt the ice or remove it by erosion. All these factors are collectively called *ablation*.

The period of maximum ablation is late summer when the lower part of the glacier is usually intersected by a network of small streams. These may flow on the surface for a little way but later disappear into a hole (*glacier mill*) or down a *crevasse* to join other streams below the ice. Often the lowest part of the glacier tongue will contain a large cave from which a stream or river emerges. At a certain level the loss of ice by ablation exactly balances the annual accumulation of firn. This level is called the *firn line*.

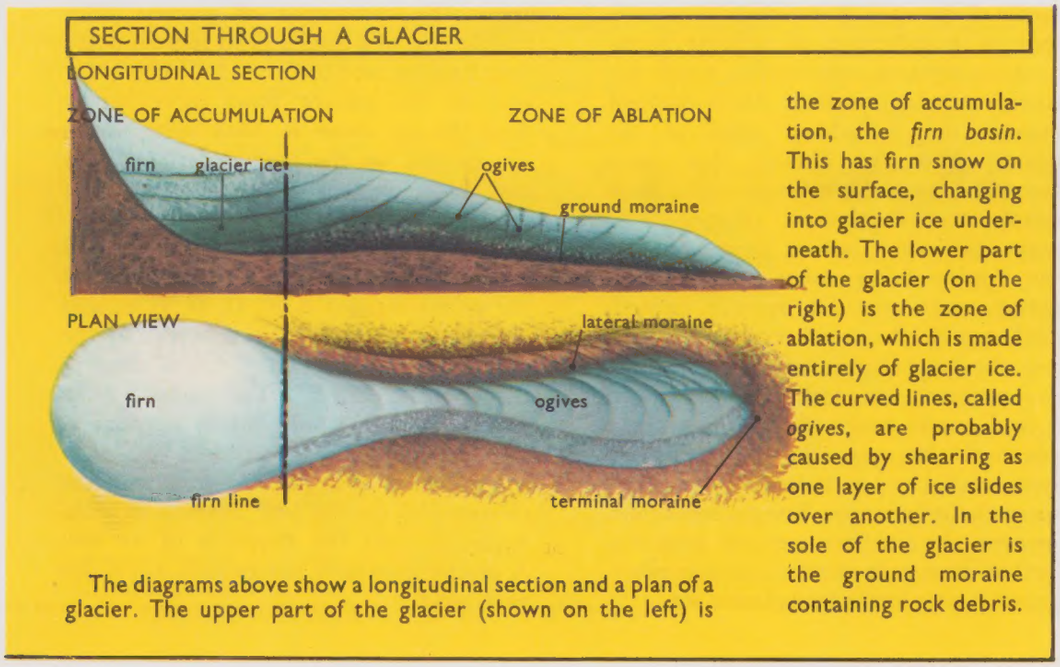
A typical glacier in the Swiss Alps

Moraines

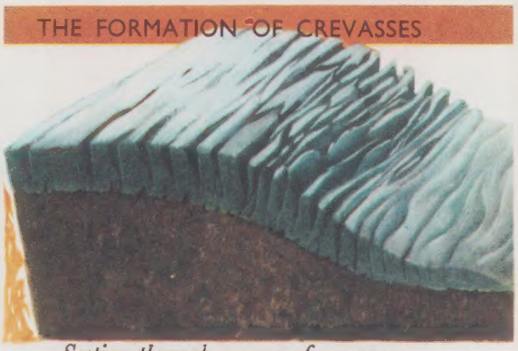
The movement of the ice over the valley floor gradually erodes the rock. The glacier carries this material away and finally deposits it lower down the valley to form long ridges of clay and boulders. These *moraines* usually collect along the sides of the glacier (*lateral moraines*), in the middle (*medial moraines*), and in front of the glacier snout (*terminal moraines*).



This imaginary mountain scene shows clearly

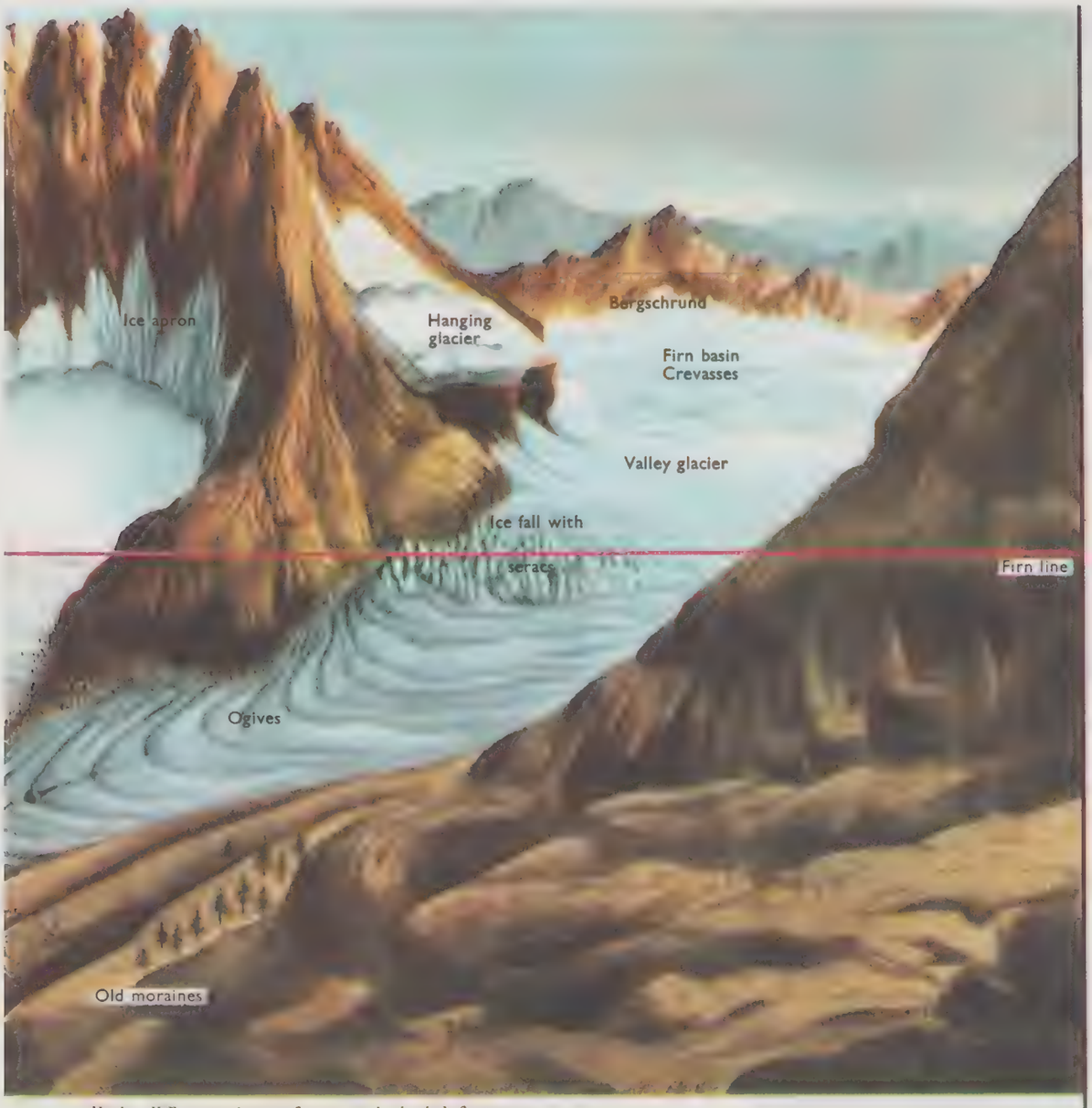


The diagrams above show a longitudinal section and a plan of a glacier. The upper part of the glacier (shown on the left) is the zone of accumulation, the *firn basin*. This has firn snow on the surface, changing into glacier ice underneath. The lower part of the glacier (on the right) is the zone of ablation, which is made entirely of glacier ice. The curved lines, called *ogives*, are probably caused by shearing as one layer of ice slides over another. In the sole of the glacier is the ground moraine containing rock debris.



Section through a zone of crevasses

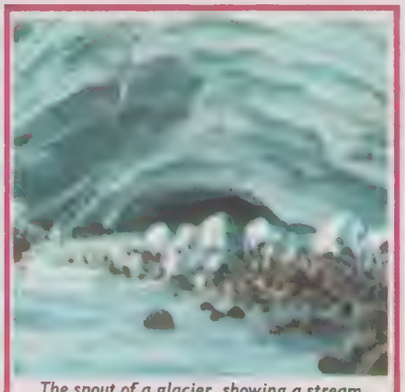
Although ice can flow under pressure, the upper layers of the glacier are quite brittle. The movement of the underlying ice therefore causes large cracks (called crevasses) to appear across the surface of the glacier. These usually occur in zones stretching right across the glacier,



all the different glacier forms and glacial features

A marginal lake of meltwater formed between the glacier and the valley side

A glacier table. The ice beneath the boulder has not melted as quickly as the surrounding ice



The snout of a glacier, showing a stream flowing from a cave in the ice

The margin of ice and moraine. Morainic dirt lies on the ice in which old crevasse lines are visible.

especially where the valley floor steepens. A large crevasse, known as the *bergschrund*, always occurs between the mountain side and the moving ice at the head of the firn basin. Crevasses become narrower below the surface and few are more than 150 to 200 feet deep. They are a serious danger to mountaineers, however, for the best route up a high mountain is usually across one of its glaciers. To avoid avalanches, the climbers may go up the middle of the glacier, but it is here that the crevasses are most numerous. Below the firn line they are easily seen and the climbers can jump across. But in the firn basin the crevasses are often concealed by a layer of snow; sometimes this forms a bridge, but sometimes it is not strong enough to bear a man's weight, and is an added danger.

Seracs *formed by the weathering and ablation of walls between crevasses*

THE CHINESE

A street scene in present-day China: a crowd around a chestnut seller. Above him are signs advertising his wares

IN the thousands of years of China's history, her people have accepted suffering as just another fact of life, like birth and death. In the north the Chinese have suffered from flood and drought; in the south from typhoons. Disease has continually attacked China's undernourished peasantry. The country as a whole has suffered from over-population which has drained its resources, and from famines which have starved millions to death. Last, but not least, corrupt landlords have ruthlessly exploited the peasant farmers.

But all this did not make the Chinese a weak or helpless people. In fact they were intensely proud. They knew that they had the longest national history of any country in the world, extending back well over 2,000 years before Christ. In the 19th century western Europeans were regarded as barbarians, and the British ambassadors were expected to kneel before the Emperor of China and bang their heads on the floor as a mark of respect. Although the peasants were illiterate, overworked and often hungry, they were not resentful of their hard life – it had been going on for so long that they just did not care.

In the 19th century the Chinese had a new misery inflicted on them – foreign aggression. This was to jolt the Chinese out of their immobility. Great Britain established herself in Hong Kong, having previously launched a series of destructive attacks, while Japan and Russia too began to cast greedy eyes on their colossal neighbour. If China was to survive she *had* to reform. In 1912 the Manchu dynasty was overthrown, and a republic replaced the empire. Yet this was not enough. After the First

World War a bitter feud developed between two factions in the republic: Nationalists led by Chiang Kai-shek, and a small Communist settlement in North China led by Mao Tse-tung. So, to the horrors of natural poverty and foreign aggression, was added the calamity of civil war. Somehow the Communists held out. On one occasion they had to flee on a long march of over 6,000 miles away from the pursuing army of Chiang Kai-shek. During their year's march northwards they lost one sixth of their original 300,000 and fought literally hundreds of skirmishes with Chiang Kai-shek's troops.

In the face of fresh Japanese attacks and the menace of the Second World War the factions united in an uneasy truce. During that war China lost more of her population than any other country in the world except the Soviet Union. The misery caused by war, the support given by Communist Russia, and the reaction against Fascist Japan immeasurably strengthened the Chinese Communists. After the world war, civil war continued until, in 1949, the Nationalist government of China was driven right off the mainland into Formosa, and the Chinese People's Republic was established with its capital at Peking.

The Communist government today is endeavouring to do something entirely new in China – rule by dogma rather than by custom and tradition. The land, industry, religion, costume, education – in fact everything – is being altered in the efforts of the Chinese leader, Mao Tse-tung, to modernise China and make sure that internal distress is eradicated from China's life and history.

People with a difference

No-one is certain exactly where the Chinese came from. It is likely that many thousands of years ago they emigrated south-east from central Asia, but as a group and indeed as a nation they have a continuous history reaching back over 4,000 years. They are distinguished by their yellow skins, slanting eyes, and lack of facial hair. Those in the north are on the whole taller than those in the south. But China consists of more than simply the Chinese. In the southern mountainous region of Old China there are many aboriginal tribes: some tall, others short; some with yellow skins and Mongolian features, others with white skins and almost European features. All speak different languages. On Formosa there are aboriginal tribes who, within living memory, were head hunters, and no man was considered marriageable unless he possessed someone's head! But, again, China consists of more than Old China. She has expanded her frontiers in all directions and far north of the Great Wall. Today she numbers among her population Manchus from Manchuria, Mongols from Inner Mongolia, Tibetans, Koreans, and the Turkic people from the Sinkiang region of north-west China.

Staggering numbers

The big struggle in China is between the old and the new. The Communists are attempting to alter in a matter of years the ingrained customs of millennia. But they cannot alter the basic problem which always confronted the Chinese – how to produce enough food for their colossal population.

Despite China's population of almost 800,000,000, about three-quarters of the country is almost uninhabitable desert or mountains. The age-old task has always been to exploit to the full those regions that will support a large population. Thus the most productive parts of China, such as the river basins of the Hwang Ho, the Yangtze Kiang and the Si Kiang, have fantastically dense populations. In places there are over 2,000 persons to the square mile – a staggering figure for a rural population. Chinese agricultural methods have to provide for this extraordinary concentration of people. To do this they have cultivated every possible inch of land. They have carefully 'terraced' the steeper slopes and painstakingly isolated each little 'field' with a mound of earth. The field may be only a few square feet in area! Water is retained by the mound of earth before it trickles to the field in the terrace below. Each plot is ingeniously manured and fertilised, and where, in the south, rice is the dominant crop, the soil has been made so productive that (without a rest for thousands of years) it produces other crops as well as rice, like tea, silk, and cotton.

Communist collectivism has altered the ownership of land. Where before the land-owner would take perhaps half the peasant's crop in taxes, today the land is owned by village communities of peasants. But despite some increase in mechanisation, the traditional agricultural methods predominate – as does the hazard that in a bad year hundreds of thousands are at once threatened with starvation.

In the north many of the people have never seen rice. Here the staple crops are wheat, millet, and some maize and potatoes. Yet the alternating drought and floods make farming an even more hazardous business than in the south, and famines are frequent and appalling occurrences. Those relatively few Chinese (perhaps one sixth) who do not till the soil live in the big cities like Peking or Shanghai. Textiles, coal, iron, and steel have all expanded enormously as industries since the Communist take-over and factory workers are in great demand. Great improvements in education have taken place, partly to improve the efficiency of the workers. It is now compulsory for all except those in the most remote regions. Yet illiteracy is still high. In rural areas nearly three-quarters of the people are illiterate, and in the towns about one quarter.

Tradition versus revolution

The Chinese are a superstitious rather than a religious people. While it is true that Buddhism spread into China, it has been *absorbed* rather than *adopted*. In fact the majority of Chinese are dominated by the principles of Confucius and take from other religions what suits their own inclinations and temperament. The dominant faith is ancestor-worship, symbolised by the typical Chinese pigtail, since one's hair is supposed to belong literally to one's ancestors. Alongside respect for dead relatives exists respect for those who are living. Many Chinese families used to live together in huge units with the parents, married sons (and their wives and children), and their unmarried children as well under the same roof. The woman's job was merely to stay in the home and bear children; Chinese families are enormous. Of course Communism has altered many Chinese traditions. The sanctity of marriage has been destroyed, for whereas before the Communists it was a child's duty to marry whom its parents chose, the Communists regard marriage as simply an equal contract which either party can terminate by divorce whenever they want to. Then again, by the principle of 'equal pay for equal work', women have been encouraged to follow careers instead of marriage. The Communists are hostile to religion and, although they have felt unable to abolish the older Chinese religions, Christian and Muslim missionaries have been persecuted and expelled.

All China is in a state of flux – really deep-rooted flux – for perhaps the first time in her existence. There can be few more fascinating problems than whether the Chinese Communists have bitten off more than they can chew in their efforts to turn the most conservative people alive into ardent revolutionaries.

LIMBS OF ARTHROPODS

WHEN we consider the limbs of the higher vertebrate animals, the reptiles, birds, and mammals, we find that they are usually organs of locomotion, used for walking and running, and it is clear that they were originally evolved for this purpose. However, quite frequently they have become adapted for other purposes. Our own forelimbs are designed for grasping and handling things; those of bats and birds are used for flying; and seals and whales use theirs for swimming.

THE LIMBS OF INSECTS

Insects nearly always have three pairs of legs, never more, which are attached to the fore, middle, and hind segments of the thorax. These limbs, like those of all arthropods, are very flexible and the joints are arranged on a plan that is similar in all insects. So the different joints or segments can be given names, just like the corresponding bones in the skeletons of different vertebrate animals. Some of the names have been borrowed from human anatomy, such as *femur* and *tibia*, which are the Latin words for thigh and shin. There is, however, no true correspondence between the femur of an insect and the femur or thigh of a man.

① *Coxa;* this is the basal segment by which the limb is attached to the thorax; it is usually short.

② *Trochanter;* always a short segment.

③ *Femur;* like the thigh of vertebrates, this is usually the strongest segment of the leg. In such insects as grasshoppers it is thickened and contains powerful jumping muscles.

④ *Tibia;* this or the femur may be the longest segment; the tibia is usually slender.

⑤ *Tarsus;* this is almost always divided into two to five smaller segments.

⑥ *Pretarsus;* the pretarsus is the insect's foot. It has a complicated structure; there is usually a pair of claws, and under each claw a pad called a *pulvillus*; between the claws is a bristle. This helps the insect to hold on to both rough and smooth surfaces.

The only group of invertebrate animals that has developed efficient limbs is the arthropods, which include such creatures as insects, spiders, centipedes, and crustaceans (see pages 551–553). Their limbs differ from those of vertebrates in having the hard part, or skeleton, outside and the muscles inside, so that the limb has the form of a jointed tube.

Arthropods may have as many as 400 limbs, adapted for a great variety of purposes.

Adaptation and specialisation

The variety of adaptations shown by the limbs of arthropods is even greater than among the vertebrate animals. Here again the basic purpose of the limbs is locomotion, and we find adaptations for running, jumping, climbing, and, among the aquatic insects and crustaceans, for swimming. Many arthropods have limbs adapted for seizing their food; among these are the mantis and the crab. In others one pair of limbs is used for digging, as in the mole-cricket. Often we find limbs highly specialised for quite peculiar purposes: the hind legs of bees carry little 'baskets' for carrying pollen back to their nests. Grasshoppers 'sing' with their legs by rubbing them against the wing-cases, and crickets have their ears on their fore-limbs, and so may be said to use their legs for hearing. The foremost limbs of centipedes are used to inflict a poisonous bite, working rather like the fangs of a snake. A few of these remarkable adaptations are illustrated on this and the next page.

① *leg of a running beetle, which, unlike that of many arthropods, has no special adaptations*

② *leg of a grasshopper; the femur is greatly developed, an adaptation for jumping*

③ *predatory fore-limb of a mantis, with spines and claws for seizing its prey*

④ *limb of the mole-cricket, bearing strong teeth, specially adapted for digging*

⑤ *hind leg of a worker bee, equipped with 'brush' and 'basket' for gathering pollen*

⑥ *leg of a water beetle, which has a fringe of hairs so that it functions as an oar*

⑦ *tarsus of the fore-leg of a male diving beetle; the suckers are used to hold the female*

⑧ *pretarsus of a fly, showing claws and pulvilli. On the right: the foot at rest*

THE LIMBS OF ARACHNIDS

The most numerous and familiar members of the class of arthropods called Arachnida are spiders; scorpions and ticks are also included in this class. Arachnids have eight legs, a feature which immediately distinguishes them from insects, which, as we have said, never have more than six.

The legs of arachnids are formed on a plan similar to that of the insects, but the last segment, the tarsus, ends in one, two, or three claws. The legs of scorpions and ticks are used only for walking, and so are not specialised in any way. Among the spiders, however, highly specialised limbs are found in some species.

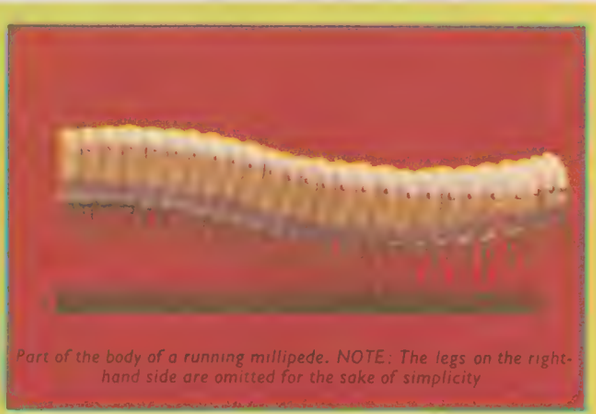
The feet of the well-known spiders that make orb-webs, like the garden spider, bear three claws, two of which are toothed like tiny combs. This arrangement of claws enables the spider to manipulate the silk during the complicated operation of making its web.

The tip of a spider's leg, greatly enlarged to show the 'combs' used in manipulating the silk

THE LIMBS OF CENTIPEDES AND MILLIPEDES

Centipedes and millipedes used to be classified together as the Myriopoda, but they are now regarded as separate classes of arthropods, the centipedes being called Chilopoda and the millipedes Diplopoda.

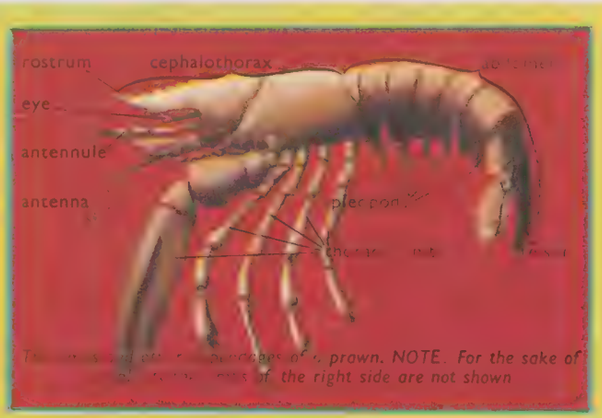
Their English names mean 'hundred-legs' and 'thousand-legs', but the common centipede has only 15 pairs, and although millipedes have considerably more, some possessing about 200 pairs, none of them has anywhere near a thousand. Centipedes have one pair of legs on each body segment, millipedes have two pairs. The poison jaws or fangs of a centipede are really modified legs adapted for biting. The way in which these animals walk is very interesting: a chain of nerve-ganglions runs the length of the body and sends impulses to the legs, so that they move in a definite order, touching the ground, then lifting and moving forward again in a series of waves.



Part of the body of a running millipede. NOTE: The legs on the right-hand side are omitted for the sake of simplicity

THE LIMBS OF CRUSTACEA

The plan upon which the limbs of crustaceans are arranged is less simple than that of the other arthropods. A crab or a lobster has four pairs of walking legs, and in front of them another pair of limbs which are modified for grasping, and which are called the *chelae* or claws. These five pairs of limbs are joined to the thorax and so are called thoracic limbs. In front of them there are three more pairs of appendages called the *maxillipeds* or 'foot-jaws', which are used in feeding. On the abdomen there are five pairs of limb-like appendages called *pleopods*, which have various uses in different kinds of crustaceans: they may be used for swimming, for fanning water on to the gills, or for carrying the eggs. The fan-like structure, or *telson*, that forms the tail of a prawn or lobster consists of modified limbs. Specialisation of the thoracic limbs in crustaceans is generally for walking, swimming, and grasping.



The [illegible] of a prawn. NOTE. For the sake of [illegible] of the right side are not shown

THE MEDITERRANEAN

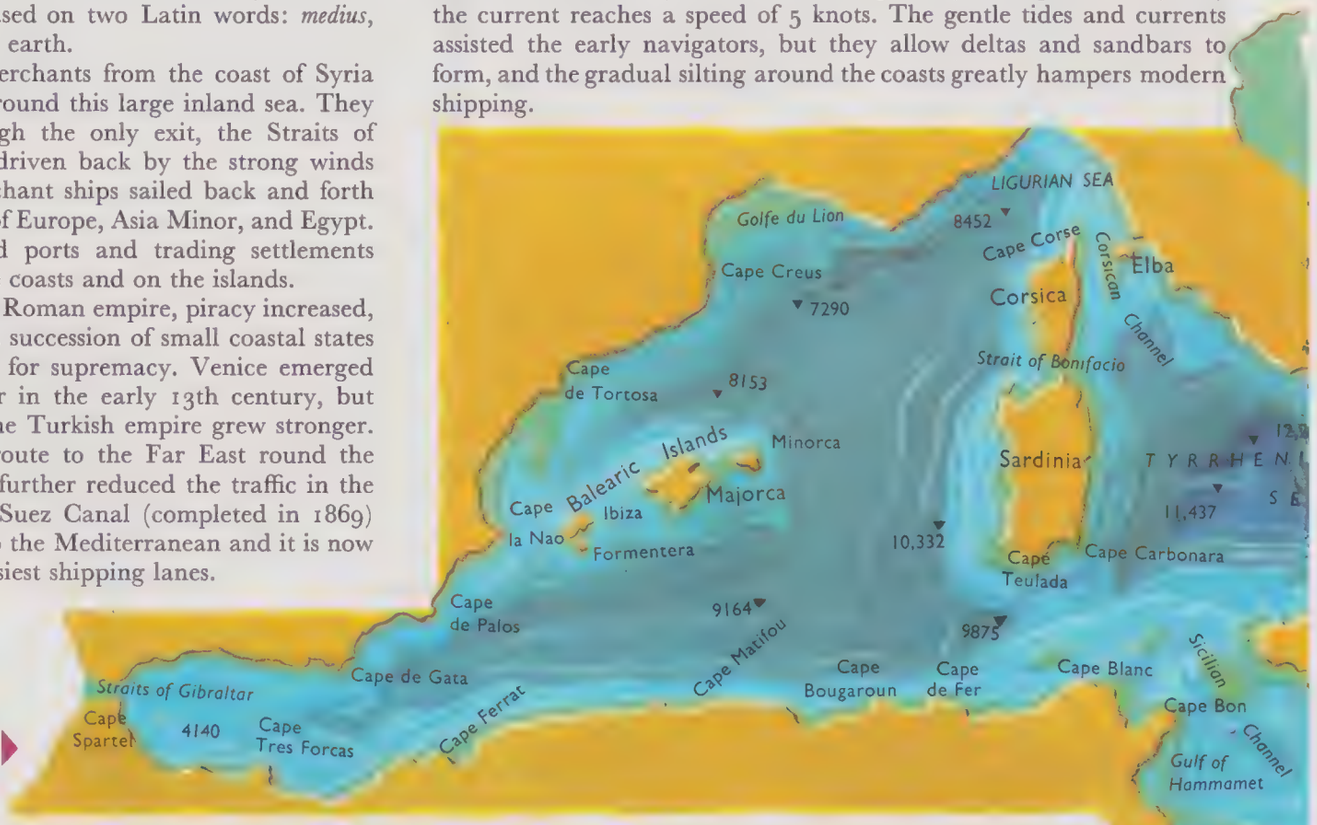
THE Mediterranean Sea was the centre of the ancient world, its principal highway and trade route. At the height of their power, the Romans referred to it as *mare nostrum* – 'our sea' – and the name by which it is known today is based on two Latin words: *medius*, middle, and *terra*, the earth.

The Phoenician merchants from the coast of Syria were the first to sail round this large inland sea. They even ventured through the only exit, the Straits of Gibraltar, but were driven back by the strong winds of the Atlantic. Merchant ships sailed back and forth between the empires of Europe, Asia Minor, and Egypt. Trade flourished and ports and trading settlements sprang up around the coasts and on the islands.

With the fall of the Roman empire, piracy increased, trade declined, and a succession of small coastal states vied with each other for supremacy. Venice emerged as the greatest power in the early 13th century, but in turn declined as the Turkish empire grew stronger. The discovery of a route to the Far East round the Cape of Good Hope further reduced the traffic in the Mediterranean. The Suez Canal (completed in 1869) brought trade back to the Mediterranean and it is now one of the world's busiest shipping lanes.

Tides and currents

The Mediterranean is not a tideless sea but the tides are not strong. They vary from a range of 6 feet (in the Gulf of Gabes) to 3 feet (at the Straits of Gibraltar) down to 2 or 3 inches (at Corfu). In shallow water, as at Venice, the tide exposes extensive mud flats. The currents also are slight, moving in an anticlockwise direction in each basin. But they are stronger in the narrow tidal passages – at the Straits of Messina (the site of the legendary whirlpool Charybdis) the current reaches a speed of 5 knots. The gentle tides and currents assisted the early navigators, but they allow deltas and sandbars to form, and the gradual silting around the coasts greatly hampers modern shipping.



A map showing the main physical features of the Mediterranean Sea

How the Mediterranean was formed

The inland sea that we know today is a shrunken remnant of an earlier, much larger one. Known to geologists as the Tethys, this sea lay between the land masses of Europe and Africa in Triassic times (about 180 million years ago), and in geological reckoning the formation of the Mediterranean is comparatively recent. The rivers of these vast continents deposited large quantities of mud and sand in the Tethys. As the silt accumulated, thousands of feet deep, the floor of the sea sank. About 50 million years ago great movements within the earth made the land masses come closer together, forcing the accumulated silt upwards to form the mountain chains that now stretch around the northern coast from Spain to Asia Minor. Further upheavals pulled the continents apart once more, leaving the Mediterranean divided by Italy and Sicily into two basins, and forming an uneven sea-bed. Earthquakes and volcanic eruptions still affect the Mediterranean area – southern Spain and Italy, Greece and Asia Minor are the most stricken countries in the world.

The Black Sea, in the east, is also land-locked, and is an extension of the Mediterranean. It is separated from the eastern basin by the Dardanelles and Bosporus, with the Sea of Marmara in between. To the west, the Straits of Gibraltar form the only natural exit, linking the inland sea with the open ocean.

The temperature of the water

The Mediterranean lies in one of the sunniest parts of the world. Its water is warm and salty and differs from other oceans in that the temperature does not fall considerably even at extreme depths. In winter, the temperature at the surface of the Tyrrhenian Sea (latitude 41°N) is 58°F, while it is as high as 56°F at depths of over 10,000 feet. At the same latitude and depth in the Atlantic, the water temperature is only 40°F. In summer, the surface temperature may reach 80°F in the south-east Mediterranean, but the depth temperatures remain almost unchanged.

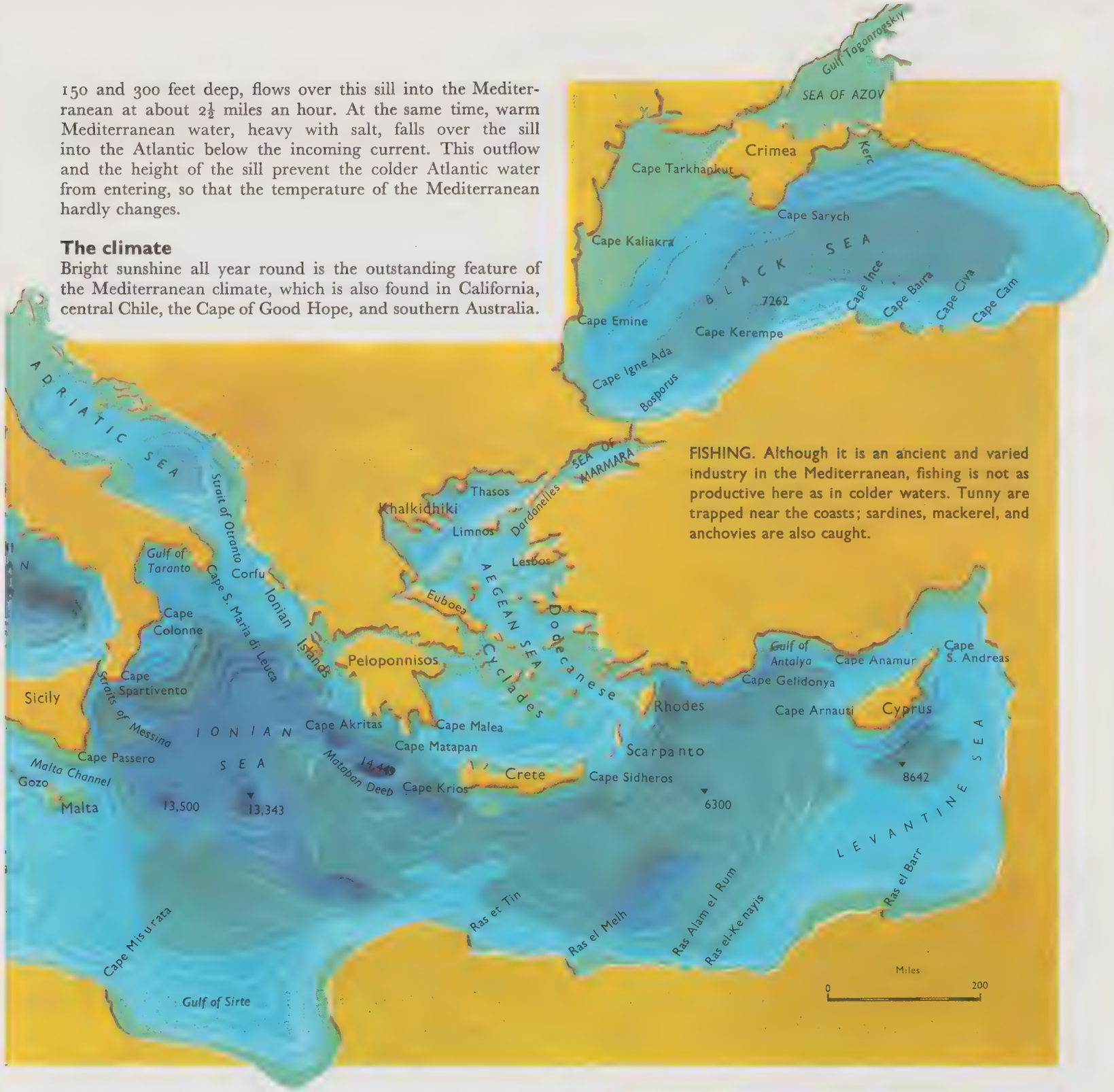
The saltiness of the Mediterranean is caused by evaporation, which is intense, especially in the summer. This evaporation would cause the level of the Mediterranean to drop 3 feet every year, so that in time it would become another Dead Sea if the water lost was not continually replaced. There are three sources of water supply. Rivers provide only a small proportion – 8 per cent – of the water needed. Most of them are short because the mountains in which they rise are near the coast, and their water is mainly used for irrigation during the hot, dry summers. Rain and condensation over the sea replaces about 20 per cent. The Atlantic Ocean supplies the remaining three-quarters.

The sea-bed rises slightly at the Straits of Gibraltar, then slopes sharply downwards into the Atlantic, forming a sill 1,200 feet below the surface of the Straits. A current of cool, less-saline water, between

150 and 300 feet deep, flows over this sill into the Mediterranean at about 2½ miles an hour. At the same time, warm Mediterranean water, heavy with salt, falls over the sill into the Atlantic below the incoming current. This outflow and the height of the sill prevent the colder Atlantic water from entering, so that the temperature of the Mediterranean hardly changes.

The climate

Bright sunshine all year round is the outstanding feature of the Mediterranean climate, which is also found in California, central Chile, the Cape of Good Hope, and southern Australia.



FISHING. Although it is an ancient and varied industry in the Mediterranean, fishing is not as productive here as in colder waters. Tunny are trapped near the coasts; sardines, mackerel, and anchovies are also caught.

The summer is hot and dry. Light winds blow from the north, north-east and north-west from May to September. Little rain falls – Rome, for example, has less than 1 inch of rain during July. The amount of rain that falls during the cool season varies from place to place around the coast; Kotor in Dalmatia (beside the Adriatic Sea) has a rainfall of 172 inches a year, while much of Spain has less than 20 inches a year. The winter is mild, with north-westerly winds blowing across the warm surface of the sea, encouraging the growth of olives and citrus fruits.

Two strong winds, peculiar to the Mediterranean, blow from the north in winter, bringing squalls and rainstorms. The *mistral* sweeps down the Rhône valley to the south of France, and the *bora* blows along the coast of the Adriatic. A hot wind, the *sirocco*, sometimes blows across the Mediterranean from Africa, especially in spring.

PERSIA

A winged griffin in enamelled brickwork which decorated the walls of the palace of Darius at Susa. This is part of a frieze of strange animals discovered in 1884, and is now in the Louvre in Paris. Little was recovered from the palace except glazed bricks, fragments of columns, capitals, and a marble bull, for the site had been quarried through the centuries and its stones and bricks used to enrich other cities

MUCH of the Middle East is so backward now that it is not always easy to realise what a great civilisation once flourished there. When Ancient Britons were living in primitive conditions, the Middle East was full of great cities teeming with people and glorified by magnificent buildings. The ruined palaces of ancient Persia are reminders of the glory that has vanished. This, for instance, is how the palace of Susa, belonging to King Xerxes (486–465 B C) is described in the Book of Esther in the Old Testament:

'The King made a feast unto all the people that were present in Shushan the palace . . . in the court of the garden of the King's palace; where were white, green, and blue hangings, fastened with cords of fine linen and purple to silver rings and pillars of marble; the beds were of gold and silver, upon a pavement of red, and blue, and white, and black marble. And they gave them drink in vessels of gold.'

The construction of this magnificent palace was started by King Darius I (522–485 B C), father of Xerxes.

A reconstruction of the palace at Susa. Today only the foundations

The finely carved capital of a column from the royal palace at Susa

PERSEPOLIS

Even more spectacular than Susa was the city of Persepolis, founded by Darius I between 520 and 515 B C. The site he chose for his new capital was a fertile valley protected by steep mountains. Darius had a great terrace constructed on a spur of rock at the valley's edge, encircled by walls, with the mountain itself forming a barrier on the north-east. The terrace was 1,500 feet long and 920 feet wide, and was levelled at three different heights. It was approached by a stairway wide and gradual enough for 10 horsemen to ride up it abreast, and by another steeper staircase for those on foot. On the south wall of the terrace Darius had carved: 'On this platform was a fortress built. Before this there was no fortress. According to the will of Ahura Mazda (Ahura Mazda the Good, a Persian god whose emblem was the winged disc or sun) did I build it, and built it entire and beautiful and precisely as I ordered.' Colossal buildings were constructed of dark grey marble from the mountain, or of unbaked brick reinforced with stone, including the royal palace of Darius and his successor Xerxes, with their treasuries, storehouses, and, most imposing of all, their audience halls.

The royal palace was entered by a portico leading to a pillared hall, surrounded by smaller rooms with windows and niches formed in stone. The stone stairways, doorways, and windows were enriched with splendid reliefs. The double staircase leading to the audience hall of Darius had magnificent carvings showing tribute bearers from all over the Persian empire mounting the stairs on one side, while guards and courtiers watch them from the other. Sculptured doorposts inside the palace show the king enthroned, surrounded by his courtiers, and heroes fighting with bulls or mythical beasts. Friezes and cornices were decorated with glazed tiles in dazzling colours.

N PALACES

The decorated base of one of the columns from the palace at Susa

Persian columns

One of the most spectacular features of Persian building is the use of great decorated marble columns. These were often fluted and elaborately carved, the bases and capitals ornamented with flowers and their upper parts strengthened by carved animals. The Hall of a Hundred Columns at Persepolis, 225 feet square, still rises from the terrace like a forest of marble columns, though the ceiling and walls have long since disappeared.

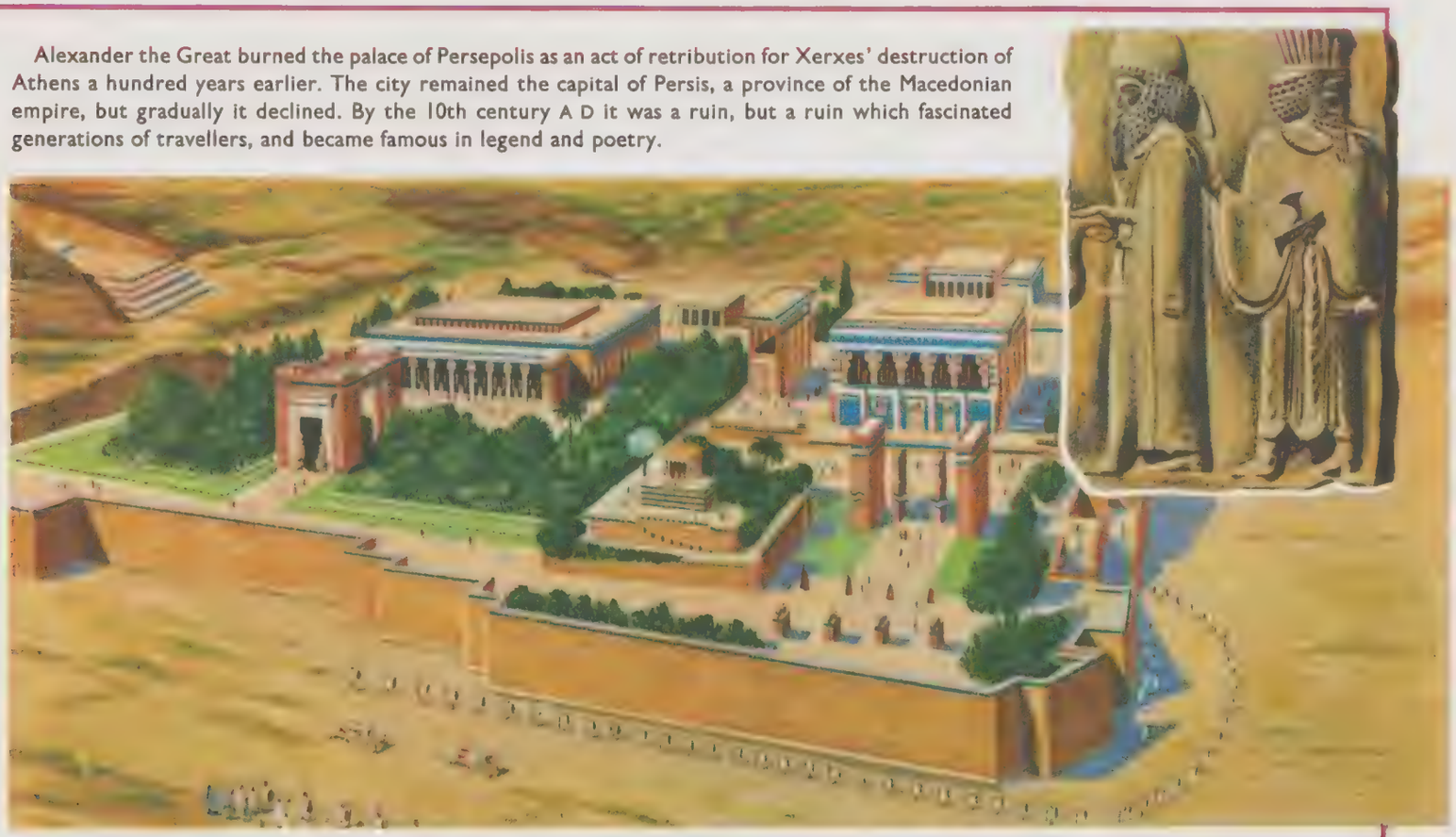
remain on the flat summit of the hill

The palace of Susa

After Cyrus (559–520 B C), the greatest Persian ruler was Darius I. Today nothing remains of the magnificent palace he built at Susa but mounds of earth. He employed craftsmen from Egypt, Greece, Lydia (now part of Turkey), and Babylon. He had cedars sent from Lebanon by river, oaks from the Indus valley, ivory from India and Ethiopia, silver and copper from Egypt. The palace was laid out round three central courts, on which opened rooms and halls of varying sizes, decorated with stone sculpture and brick panels glazed in brilliant colours. Under Persian rule Susa was described by a Greek king as 'that city where the Great King has his residence and where the money is laid up in treasuries. After you have taken the city, you may challenge Zeus himself in the matter of wealth'.

Alexander the Great marched on Susa after his victory over the Persians at Arbela in 331 B C, and took over the city's immense treasure, gold, silver, jewels, and beautiful woven textiles; 10,000 camels and 20,000 mules were needed to transport only a part of Susa's wealth, including two bronze statues carried off from Athens by King Xerxes and now returned by Alexander. A marriage feast was held, at which 10,000 Macedonians of Alexander's army married Persian girls. Games and a torch race were also held.

Alexander the Great burned the palace of Persepolis as an act of retribution for Xerxes' destruction of Athens a hundred years earlier. The city remained the capital of Persis, a province of the Macedonian empire, but gradually it declined. By the 10th century A D it was a ruin, but a ruin which fascinated generations of travellers, and became famous in legend and poetry.



The marvellous palace of Darius at Persepolis; (above right) detail of a frieze from the palace

ULSTER - modern history

'NO surrender!' The answer the Protestant defenders of Derry gave to the Catholic forces of James II echoes through the history of Northern Ireland. This fighting spirit twice saved the day for the Protestants of Ulster when the odds were very much against them.

The first occasion was in 1689 when James II, a Catholic, landed in Ireland, which was then under British rule (see page 1453). At the beginning of the century Protestants (mainly Presbyterians) from northern England and the lowlands of Scotland had been settled in parts of the Irish province of Ulster by the British government. The Catholic Irish had long wanted to get rid of these settlers and when James II came to the throne they thought their opportunity had come. But thanks to the bravery of the defenders of Derry, who refused to surrender to the forces of James II, and also to the landing of William of Orange with a large army, the settlement was saved. On 1st July (12th July by the new calendar) 1690 William of Orange defeated James at the Battle of the Boyne.

Rule by the Catholics?

The second great crisis in Ulster's history came at the beginning of this century, but its roots went as far back as 1800 when the Act of Union was passed uniting the Parliaments of Great Britain and Ireland. In 1829 Catholics were allowed to sit in the Westminster Parliament (see page 1484) and from then on their agitation for Home Rule grew. If this were granted, it would have meant that a predominantly Catholic Parliament would have been set up in Dublin – the Ulster Protestants did not like this idea at all.

When Gladstone (see page 1636), the great Liberal statesman, became determined to give Ireland Home Rule, the Ulstermen really got alarmed. However, Gladstone never succeeded in getting his Home Rule Bill passed by Parliament.

Sir Edward Carson, Ulster's leader in her second great crisis

By 1911, during the Liberal government of Asquith, it looked as if nothing could stop the Home Rule Bill getting through (see page 1485). Asquith, with the support of Irish Nationalist MPs under John Redmond, had an unassailable majority. Moreover, by the terms of the 1911 Parliament Act, the largely Conservative House of Lords could now only hold up the Home Rule Bill for two years.

In 1912 the Home Rule Bill passed through the Commons. The Protestants in Ulster declared that they would fight not to be governed from Dublin. In 1914 tension was high in both Britain and Ireland. In March, in what is now known as the Curragh Mutiny, many of the British officers at the Curragh camp, outside Dublin, said they would not march against Ulster if called on to do so.

The threat of civil war

Ulster was extremely lucky in this period to find a brilliant leader, Sir Edward Carson, a well-known barrister. In April 1914 Carson managed to land a shipment of arms from Germany – the Irish nationalists in the south also managed to get arms, so that civil war looked unavoidable.

The Protestants were now not opposing the setting up of a Parliament in Dublin – they were saying that the Presbyterian counties of Ulster would not be subject to it. Redmond conceded that the counties of Antrim, Armagh, Derry, and Down should temporarily be excluded from the rule of Dublin – but not Fermanagh, Tyrone, and the city of Derry, where the numbers of Catholics and Protestants were fairly well balanced. In September 1914 the Home Rule Bill received the Sovereign's assent – but it was accompanied by an act suspending its operation until the end of the war, which had just broken out.

In 1920, by the Government of Ireland Act, Lloyd George, the British Prime Minister, set up two Parliaments: one at Stormont near Belfast, for six counties of Ulster: Antrim, Armagh, Derry, Down, Fermanagh, and Tyrone; the other at Dublin for the remaining 26 counties. Many of the Irish nationalists did not at first accept this compromise, and fighting followed in the 26 counties.

Today the six counties of Ulster still have their own Parliament, and enjoy a certain amount of self-government inside the framework of the United Kingdom. Certain extremists like the IRA (Irish Republican Army) still refuse to accept the independence of the six counties and make occasional attacks on customs huts and police barracks. Northern Ireland's main problem is now not to keep her independence, which is for the moment assured, but to reduce the unemployment rate, which is among the highest in the British Isles.

The six British counties of Ulster; the others (Cavan, Donegal, and Monaghan) belong to Eire

The winner of the Favourite Animals Competition comes to claim her prize

PENNY MEETS TOTO

Penny, winner of the Favourite Animals Competition, is congratulated by William Armstrong of 'Knowledge', with full approval of Toto the baby elephant

'Is it good to eat?' asks Toto as Cyril Littlewood (left), director of the Wildlife Youth Service, presents Penny (centre) with her Wildlife Rangers membership card. Looking on are two Rangers, Brenda and Pauline Richardson, and William Armstrong and Joyce Bentley of 'Knowledge'

ON a brilliantly sunny day at the beginning of August, Penny Moon, the winner of the Favourite Animals Competition, came to London to meet her prize – Toto the baby elephant. *Knowledge* have adopted Toto for a year on Penny's behalf. During an exciting day at the Zoo in Regent's Park Penny played with Toto and many other animals, and was also enrolled as a member of the Wildlife Rangers. On this page you can read all about her visit to London.

ELEVEN-year-old Penny and her mother were greeted on their arrival from Lewes, in Sussex, by the Editor-in-Chief, John Chancellor. He congratulated Penny on her success and introduced her to the editorial staff of *Knowledge* at 37 Hertford Street.

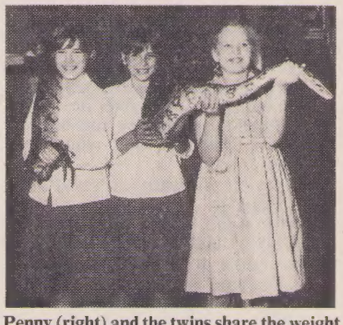
Cyril Littlewood, director of the Wildlife Youth Service, also congratulated Penny and enrolled her as a member of the Wildlife Rangers. Two Rangers, 13-year-old twins Brenda and Pauline Richardson, were there to keep Penny company.

After a delicious lunch at London Zoo, Miss Crammond, the Zoo's Information Officer, introduced Penny to her prize – Toto. They made friends quickly, perhaps because the 'No Feeding' rule was for once ignored. Toto finally left for his daily walk round the park, while Penny went for a ride on a bactrian camel. Miss Crammond arranged a tour 'behind the scenes' so that Penny could see the animals at closer quarters and handle some of them. Two mongooses, one from India and one from Egypt, reminded Penny of her own pet – a mouse.

But there was nothing soft or cuddly about the alligator and python that Penny bravely handled in the Reptile House.

Second to Toto in Penny's affections was Suki the tiger cub. Abandoned by her mother, Suki had been brought up by the keepers and now looked like an overgrown kitten.

Chi Chi the giant panda was not forgotten and Penny also saw many of the Zoo's other inmates. The day seemed to come to an end too quickly, and so, after strawberries and cream for tea, Penny and Mrs Moon left for home, promising to come and see Toto again very soon.



Penny (right) and the twins share the weight of a 10-foot-long python called Paula

ARMAND DENIS *may be visiting* ***your*** *town* **THIS WEEK**

Don't miss these exciting lectures about wild life and primitive peoples. Tickets can be obtained from your usual suppliers.

Town	*Hall*	*Date*	*Time*
Norwich	Theatre Royal	Monday, 9th September	7.30 pm
Bristol	Colston Hall	Tuesday, 10th September	7.30 pm
Manchester	Belle Vue	Wednesday, 11th September	7.30 pm
Southampton	Guild Hall	Thursday, 12th September	7.30 pm
Dublin	Full details from Dublin Zoo; Friday, 13th September		

Suki, the four-month-old tiger cub, shows her teeth in a ferocious snarl when the keeper picks her up . . .

. . . but when her bottle is produced she is like any other kitten and allows Penny to feed and stroke her

Peter the alligator does not protest when he is picked up

You write – thousands read!

Sun Worshippers

DEAR EDITOR—After reading your article about the Incas (*Knowledge* No. 134) I wondered why such a civilised race of people had not discovered the wheel.

One theory is that the Incas had seen wheels in use but refused to make them themselves. A wheel was the image of their sun god, and it was disrespectful to make this image run along the ground pulling heavy carts.

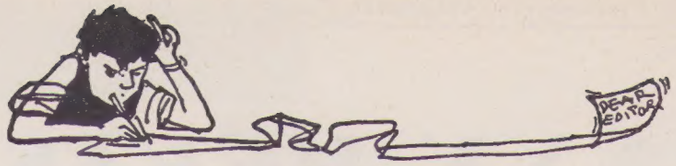
So the Incas used sledges instead that were dragged along either by slaves or by an animal.

Jane Geddes,
Oldhouse Farm,
Hildenborough, Kent.

Hell Fire Club

DEAR EDITOR—I was very interested in your article on Black Magic (*Knowledge News* dated 9th June 1963). You mentioned black mass, which is saying mass backwards. This was surprisingly performed by the Prince Regent when he was a member of Sir Francis Dashwood's Hell Fire Club. Black mass was once performed in a house where we used to live on London's famous Highgate Hill. Just after the ceremony it is said that a nearby house mysteriously burst into flames.

James Douglas (age 9),
Glenthorne, Liverpool Road,
Walmer, Kent.



Wild Man of Australia

DEAR EDITOR—I would like to tell you the story of William Buckley, known as 'the wild white man'.

He was born at Marton, near Macclesfield in Cheshire, in 1780 and was by trade a bricklayer. He was convicted of receiving stolen property and sentenced to be deported to Australia for life. When Colonel Collins brought out 307 male convicts in the transports *Calcutta* and *Ocean*, William Buckley was among them. They intended to form a settlement in the newly-discovered Port Phillip district of New South Wales, and made camp at Sorrento, now a seaside resort.

Soon reports that there were wild aborigines in the area reached Colonel Collins, and he decided to settle on Van Diemen's Land (Tasmania) instead. Before the transports sailed, William Buckley and two other convicts escaped. They had little food and only one gun and soon wished that they were not so free. Buckley's two companions, scared and desperate, decided to retrace their steps to Sorrento and give themselves up. That was the last anyone saw of them.

Buckley, now alone, made his way to Point Lonsdale and rested in a cave now named after him. From this cave he watched the departure of the *Calcutta* and *Ocean*. His feelings can well be imagined; as far as he knew, he was now the only white man in the whole of the vast Port Phillip district.

In time, he made friends with the aborigines, who accepted him as the spirit of a dead chief. He lived with them for 32 years, until he was discovered in 1835 by John Batman. Buckley was of immense physique – more than 6 feet 3 inches tall and stoutly built. Mentally, however, he was not such a giant; Batman described him as 'a mindless lump of matter'.

Later, William Buckley was criticised for the little use he made of his long sojourn with the aborigines by not recording their customs and language. However, as he could neither read nor write, this criticism is rather harsh.

The wild white man died in 1856, aged 75, after being thrown from a horse.

Catherine Carmody,
16 Kinross Street,
Pascoe Vale, Melbourne,
Victoria, Australia.

Say the Magic Word

DEAR EDITOR—Do you know what an 'abracadabra' is? It is a cabalistic word written as many times as it has letters, omitting the last letter each time until only one remains, and forming an equilateral triangle. It was used as a magical formula to conjure up healing spirits to cure disease. Here is an example:

ABRACADABRA
ABRACADABR
ABRACADAB
ABRACADA
ABRACAD
ABRACA
ABRAC
ABRA
ABR
AB
A

Gerald Stern (age 11),
6 Fairmont Flats,
Solomons Road, Sea Point,
Cape Town, South Africa.

Stranger than Fiction

DEAR EDITOR—Here is a true story. Some time during the Second World War, a bullet became lodged in a pile of logs in Sicily. These logs remained untouched until recently when a 24-year-old man took some of them to put in his stove. By a strange twist of fate, he had picked up the log containing the bullet. When he lit the stove the bullet exploded and killed him.

Stuart McQuarrie (age 10),
97 Langbar Crescent,
Easterhouse, Glasgow, E.3.

Giant Bear

DEAR EDITOR—At Taronga Park Zoo, Sydney, there is a Kodiak bear called Koko. Koko had excellent teeth until he chipped a canine and it became infected. An operation was necessary to remove the tooth. Massive doses of drugs were used to put Koko to sleep, but it took a team of 14 men five hours to remove the 3½-inch-long tooth.

Grahame Marriott,
11 Thorn Street, Ryde,
New South Wales,
Australia.

The Highest

DEAR EDITOR—A little while ago we were asked at school to give the highest possible number of three figures. The answer was $(9^9)^9$ which, when worked out, comes to 1955 followed by 72 noughts.

S. Trill,
11A Vicarage Road,
Henley on Thames
Oxfordshire.

Lighter Touch

Officer: 'There's a tramp steamer signalling us, sir.'
Captain: 'What do they want?'
Officer: 'Sixpence for a cup of coffee.'

Iain Harvey,
4 Holmston Road,
Ayr, Scotland.

Misunderstanding

Two rather deaf men were on a London bus. One said to the other, 'Is this Wembley?' to which the other replied, 'No, Thursday.' The first man then said, 'So am I,' and they both got off to have a drink.

Arthur Marriott (age 14),
5 Zion Terrace,
Norden, Rochdale,
Lancashire.

Can you answer these?

1. In what poem is Autumn called 'season of mists and mellow fruitfulness'?
2. If you saw a field of flax in flower what colour would it be, and for making what is flax used?
3. Farmers once used a 'flail' at harvest-time. For what purpose?
4. 'On either side the river lie
   Long fields of barley and of rye.'
   Where was this, and who wrote these lines?
5. What are a 'swath', a 'sheaf', and a 'stook'?
6. Who stood 'breast high amid the corn' in Hood's poem and gives her name to a book in the Old Testament?
7. The best description of a harvest supper is in the book, *Farmer's Glory*. Who wrote it?
8. What crop would you expect from a fallow field?
9. What is 'gleaning'?
10. What is a 'silo'?
11. A cornfield has a 'headland'. What is this?
12. Who told the story of a farmer who had such good crops that he built bigger barns and thereby earned the name of fool?

ANSWERS

1. *Keats'* Ode to Autumn.
2. *Blue; linen.*
3. *Threshing.*
4. *On the way to Camelot; Tennyson, in his* Lady of Shalott.
5. *A sweep of grass or corn lying after being cut; a bundle of reaped corn-stalks tied together; several sheaves propped up against each other.*
6. *Ruth.*
7. *A. G. Street.*
8. *No crop at all (except of weeds perhaps).*
9. *Collecting up any grains or ears of corn left in a field after it has been harvested.*
10. *Building into which hay or corn is put to dry.*
11. *Strip of land either left unsown or cut by hand where the reaping machine can begin its course for cutting the corn.*
12. *Jesus Christ, in one of His parables.*

BRAIN ? BOX

1. George is a commercial traveller. During the last fortnight he has had to make direct journeys from his home to Newcastle, Maidstone, Cardiff, Aberystwyth, Salisbury, and Southampton. These were six separate trips, for George returned home after each one.

   George noticed a curious thing about these places – that they were all almost exactly the same distance from where he lived, namely about 150–160 miles.

   Where do you think he lived?

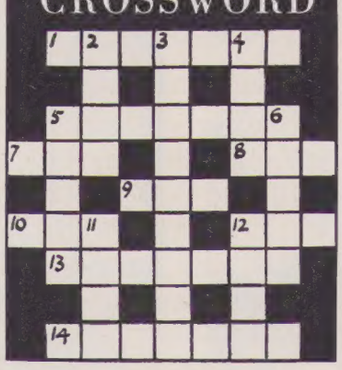
2. One hot day last Whitsun we rowed down the river to an island and spent a happy day there. It took us twice as long to row back in the evening. There was no wind and when we row we always average 4 mph (still water). How fast was the current flowing?

3. Take a thousand, a ten, a unit, and another thousand. Then take a ten, another ten, and a thousand. The result should be the same, nothing being added to the components of the first to give the second. Can you work this out?

ANSWERS

1. Nottingham.
2. One and one-third mph.
3. By obeying the instructions and using a mixture of Roman and arabic numbers, letters, and a little ingenuity, you will get the two words MAXIM and AXIOM, words of similar meaning.

HIGH-SPEED CROSSWORD



Clues Across

1. Worldly (7).
5. Strong emotion (7).
7. Musical note for the singer (3).
8. Mesh (3).
9. Limb (3).
10. Deed (3).
12. Go by air (3).
13. The Sabbath (4, 3).
14. Stooping (7).

Clues Down

2. American state (4).
3. Demolished (9).
4. Gas for light (4).
5. A marsupial has one (5).
6. Recently (5).
11. Small shark (4).
12. Glad and willing (4).

Solution next week.

SOLUTION TO LAST WEEK'S CROSSWORD

ACROSS: 4, Pages; 7, Wet; 8, Trailer; 9, Tea; 10, Sleight; 11, Nil; 12, Repairs; 15, Yes; 16, Rosas.

DOWN: 1, Pat; 2, Pea; 3, Beret; 5, Grilles; 6, Similar; 7, Wethers; 10, Siren; 13, Ion; 14, Say.

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Harvesting the grapes. This takes place in late September or early October. Hailstorms at this time of year may be a danger; rockets are fired into the clouds to break them up before the hail can damage the crops

of the wine, whether it is sweet or dry (not sweet), is not solely dependent on the flavour of the grapes. The ripeness at which they are fermented, for instance, can alter the taste of wine. One famous French wine, *Sauternes*, is made from grapes which have been left until they are overripe.

Generally white wine (yellowish in colour) is made from white grapes, and red wine (coloured dark red) is made from black grapes. But the colour of wine is not always dependent on the colour of the grapes. White wine can be made from black grapes if the stalks and skins are removed from the juice as quickly as possible. It is the skins which give red wine its colour. Rosé wines (pink coloured) are obtained by leaving the skins in contact with the juice long enough to produce a pink colour.

In France and Germany, which produce some of the best wines in the world, the year of vintage is particularly important. 1957 may be a good year for one district and a bad year for another. All good-quality wines normally always have their district of origin and the date of their vintage on the bottle.

The label on the bottle can tell you a lot about the wine: the type of wine it is (for example, *Bordeaux*); the district (for example, Graves); and its vineyard (for example, Château Haut-Brion). With German wines the kind of grapes (such as Sylvaner or Riesling) is given as well as the district. Sometimes the year of vintage is put on the label, and sometimes also a description of the quality of the grapes. With French wine, *premiers grands crus* means the grapes are very good indeed.

The three types

There are three types of wine: table wine, sparkling wine, and fortified wine. Most of the world's wines are *table wines*, and are generally produced by the methods just described.

The *sparkling wines* are made to 'fizz' by bottling them before fermentation is completed or, occasionally, by pumping gas into them. *Champagne* is by far the most famous sparkling wine. However, nearly every wine-producing country has a similar sparkling wine. Up to the 19th century there was even a Welsh champagne.

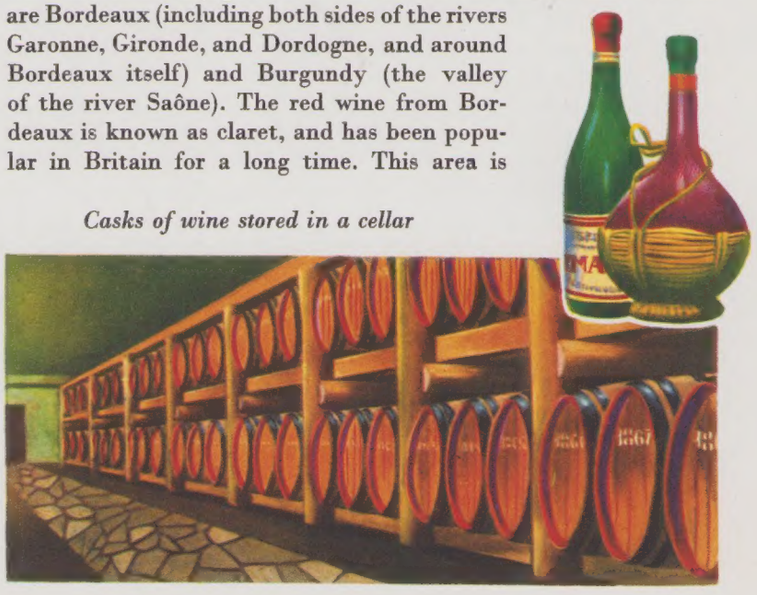
Fortified wines are those to which spirits, usually brandy, are added. These have a higher alcoholic content than the table wines and sparkling wines. The best known in Britain are sherry and port. The colour of sherry varies from amber to dark brown. It can have many flavours: for instance, *Manzanilla* is very dry, *Amontillado* is medium dry, and *Oloroso* is sweet. Sherry is usually drunk before meals. There are two main types of port, vintage and non-vintage. Non-vintage port is matured in casks and is blended and sold fairly shortly after fermentation. Vintage port is allowed to mature in bottles and the finest can be over 30 years old. Port is usually drunk after a meal. Among the most popular of the other fortified wines are: *Madeira* from that island; *Marsala* from Sicily; *Malaga* from southern Spain; and *Vermouth* from Italy.

Here different kinds of grapes are being mixed together in a vat before pressing

French wines

Many of the finest wines come from France, over most of which wine is extensively produced. The two areas that are best known are Bordeaux (including both sides of the rivers Garonne, Gironde, and Dordogne, and around Bordeaux itself) and Burgundy (the valley of the river Saône). The red wine from Bordeaux is known as claret, and has been popular in Britain for a long time. This area is

Casks of wine stored in a cellar



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divided into different districts, such as Médoc, Graves, Sauternes, and St Emilion. Some of the world's most famous wines come from Bordeaux, including those from the vineyards of Château Lafite, Château Margaux, and Château Yquem.

Burgundy produces red and white wines. From the north of the area comes *Chablis*, a white wine often drunk with shell-fish. Other well-known districts are the Côte de Nuits (from which comes Nuits-St Georges), the Côte de Beaune, famous for its white wines, and Beaujolais.

Wine is produced in many parts of France, and other areas producing good wine are the Côtes du Rhône, including Tavel (which produces a delicate rosé), and the Loire. Wine from Alsace is very like German wine. Perhaps the most famous French wine of all is *Champagne*, which comes from the area around Rheims.

German wines

After France, the most famous wines come from Germany, although she provides less wine than all the other great wine-producing countries in Europe. Her wines are nearly all white and do not have the same variety as those of France. Two of the oldest and most famous vineyards in Europe are in Germany: Schloss Johannesberg and Schloss Steinberg, founded in 1106 and 1131 respectively. German wines are grown on the banks of the river Rhine (these are called Hock) and of the river Moselle. Generally the Rhine wines are more distinguished than those of Moselle, though they are very alike. German wine varies from sweet to dry, but nearly all of it has a characteristic delicate and fruity flavour.

Other European wines

Italy is one of the world's largest wine producers. Her most famous wine is *Chianti*, from the district of Umbria and often sold in the well-known flask-like, straw-covered bottles. The extremely sweet southern wine, *Lacrima Christi*, is also famous outside Italy. The best-known Italian sparkling wine is *Asti Spumante*. Hungary provides a golden-coloured sweet wine called *Tokay*; the best came from the former imperial vineyards. Spain and Portugal are most famous for their fortified wines and produce no really distinguished table wines. The Greeks have some very pleasant local wines, but the majority of their wine is spoilt for Europeans since resin is added to it. Yugoslavia produces Hock-type wine as well as a red wine from Dalmatia. In the Soviet Union, Georgia and Crimea produce some pleasant sweet wines. British wine is not very highly thought of; much of it is imported grape juice with spirits added in Britain.

Non-European wines

South Africa produces some of the best wines outside Europe, and is famous for her sherries and Hock-type wines. Australia produces a Burgundy-type wine, and also has some quite distinctive wines of her own. South American table wines are quite pleasant, but except in Chile there is little of real distinction. Argentina is one of the largest wine producers in the world. The wines of the United States are rapidly improving; some Californian wines are of a very high quality, and novel methods are used in their production. Algeria produces large quantities of cheap red wine, much of which is exported to France and drunk as *vin ordinaire* (cheap wine with no marks of vintage or district of origin).

Wines and foods

There were once elaborate regulations laying down what wines should or should not be served with what food. Today there are no unbreakable rules – the best one is: drink what you like best. However, it is generally accepted that white wines should be served with fish, and sweet wines should not be drunk with main dishes. Red wines should only be served with red meat, poultry, and game. Bordeaux is more often served with chicken, and Burgundy more often with steak and game. Four wines are often served with a meal. Sherry with the soup, white wines with the fish course, red wines with the meat course, and port afterwards. Red wines are usually served at room temperature, but white wines should be slightly chilled.

If you ever drink wine in a restaurant, the waiter may pour a little into your glass. This is for you to inspect it to see if anything is wrong with it. You should hold it up to the light to see if there are any bits of cork or sediment in it. You should then sniff it and taste it, for a lot can go wrong with wine. It can become acid, watery, and occasionally 'corked'. You can tell a corked wine by its mildewy taste, which is sometimes caused by a rotten cork. In this case the wine must be sent back.

Some of the many different types of wine bottle